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ABSTRACT

This publication describes the formation and evolution of rural agribusiness (RA) in the southern hemisphere as a precondition for improving the lives of families in rural communities, and focuses on RA endeavors created by development projects in Latin America, the Caribbean, and Africa. After a short introduction, the first section of this study examines what is at stake in RA in Latin America and the Caribbean, exploring the philosophy behind and reality of RA, as well as the strengths and weaknesses of RA in the region. The second section provides three case studies of RA which concern: (1) rural cheese dairies in Salinas, Ecuador; (2) the promotion of RA in Nigeria; and (3) production of traditional nonalcoholic beverages in Dakar, Senegal. The third section discusses factors involved in producing and promoting products, and the fourth describes technical resources necessary for RA. The fifth section examines the implementation and management of RA projects. The 10 appendixes include a "socioeconomic grid" for analysis of projects, a list of abbreviations, the addresses of relevant organizations and individuals, and eight tables giving basic information about the cottage industry production of various food products. Contains 61 references. (MDM)

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RURAL AGROBUSINESS

1992 - N° 199-200

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ICC soon turned essentially toward Third World children and devoted its activities to the training and education of personnel with social, educational and administrative responsabilities as well as medical and paramedical workers. The desire for greater efficiency has led it to work increasingly with trainers and to concentrate its efforts on the methodological and educational aspects of mother and child care programmes.

ICC is also engaged in an attempt to further study — and — action on some aspects of the life and health of children and their family, so as to contribute to practical improvement, particularly in the fields of growth, nutrition, planned parenthood, the control of transmissible and nutritional diseases, preschool and school education, the needs of disabled and underprivileged children, etc.

Over this period of more than 30 years, a large amount of documents on children and adolescents, mostly from the developing countries, has been accumulated. This international documentation has been classified and sorted out, and has been computerized since 1983 : a bibliographic data base (BIRD : « Base d'Informations Robert Debré ») may be consulted anywhere in the world, through international communications networks. ICC also publishes periodicals, educational documents and specialized bibliographic bulletins.

As for its legal status, the International Children's Centre is a foundation under french law of recognized public utility, administered by an executive board with broad international membership.

CHILDREN
IN THE TROPICS

REVIEW OF THE INTERNATIONAL CHILDREN'S CENTRE

RURAL AGROBUSINESS

☐ ROLAND TREILLON
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4

1992 - N° 199-200

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INTRODUCTION*

Farmers in countries in the Southern hemisphere are faced with an increasingly uncertain situation, owing to the wave of economic liberalism and governmental disenchantment. Fluctuating markets hit them squarely, and make them intolerably dependent.

In response to this situation, there are attempts to develop strategies involving diversification of crops and the reduction of risks. Rural enterprises for the processing and commercialization of agricultural products are one possible solution. This type of enterprise already exists in most Latin American countries. The trend is not as clearcut in Africa, and existing attempts are quite varied.

On the whole, however, the trend is clear enough to earn definite recognition of the value of these enterprises. We have therefore decided to devote the present issue to them.

What is rural agrobusiness?

Rural Agrobusiness (RA) provides farmers with the possibility to improve control of their production by taking charge of the operations further down in the food chain : storage, processing, packaging, transportation and commercialization. It is not enough for farmers to produce more and higher quality food ; to better their situation, they must put this improvement to profit, failing which their efforts will come to nothing. Every prospect of progress may be blocked by losses during storage and transportation, difficulties in selling products as well as the role played by middle-men, and land-holding problems.

Improved control of processing and commercialization of products thus becomes a necessity. RA responds to this need by supplying those involved with a specially conceived frame of action. This is not a new model, or the latest invention of some theory of development : this type of enterprise already exists and is developing in many countries in Latin America and Asia, in spite of the present crisis.

The available statistics do not provide an accurate picture of this evolution (data is too fragmented and unreliable), but a number of studies conducted by PRODAR (programa de organizacion y administracion para el desarrollo rural) attest to the reality and strength of this movement. The importance of RA in the agricultural and rural development of some areas is undeniable, then. In terms of jobs and income generated, it is seen to be highly significant, as pointed out by some CIRAD research workers : "our first impression is that this type of enterprise seems to play an important and in fact a primordial role in the agricultural and rural development of some countries. In terms of jobs and income generated, these ventures contribute very significantly to rural development. They are capable of supplying markets at varying distances (cities, exportation) and in this sense they contribute to the economic integration of rural areas, while enhancing the peasant economy by enabling producers to achieve a status other than that of pure suppliers of raw materials. By enhancing the value of farm production, and by their proximity, they ensure greater security for their production."

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* **By Roland TREILLON (ALTERSYAL-ENSIA).**

Does this mean that RA may be an alternative to the largescale agrobusiness projects as a model for progress? We are convinced that this is the case, for historical reasons - the failure of oversized projects imposed from outside - and because of the relations between these enterprises and life in rural areas. The fact is, however, that the term "model" applied to RA introduces a major bias in that the latter includes extremely varied initiatives. This variety of technical, social, economic and cultural aspects depends on the history of the different enterprises, their integration in the food chain and their relations with the geographic and political environment. Given the present state of our information, they cannot yet be categorized. For the moment we may simply identify several major lines of differentiation :

- influx of products : type of raw materials, of finished products, and of markets ;

- techniques : what machines and what processes ;

- organization of human resources : who participates? Who works? Who is in charge? Who profits?

- institutional framework : what aid? What relations and with whom?

- integration in the environment, with action networks, interpersonal networks and symbolic networks.

In conclusion, it is essential to underline the distinction between traditional RA and RA generated by development projects. The former is implemented spontaneously, at the demand of local entrepreneurs and more unusually of groups of peasants, while the latter is set up and/or encouraged by the technical, financial or other support of partners who are external to the rural world.

The forthcoming chapters mostly describe the latter situation ; that is, RA induced by development projects. In part one (what is at stake in rural agrobusiness in Latin America and the Caribbean), a general presentation of RA discusses the contents of this concept, and attempts to show its importance and to illustrate the tremendous variations in training patterns.

Part two contains three case studies, one on rural cheese dairies in Salinas, in the province of Bolivar (Ecuador), another on the promotion of RA in Nicaragua, and the third on non-alcoholic beverages in Dakar : the objective of these studies is to tell the story of projects which illustrate the problems encountered.

The last part deals with the management of an RA-type project. If an RA is to be set up in a peasant community, an authentic wave of change must be generated. This must be handled as such, and for this reason we suggest that it be viewed as a project. Every project requires steering, irrespective of the individual or group of individuals in charge of the task. It is impossible to get individuals or groups to work together without defining rules and procedures, and planning for experience and information-sharing. Three aspects of this steering are emphasized : the commercial aspect (taking the market into account, by W. Bustamante), the technical side (described by J. Muchnik) and the organizational side (discussed by R. Treillon). Indeed, experience shows that these three components are decisive for any project.

WHAT IS AT STAKE IN RURAL AGROBUSINESS IN LATIN AMERICA AND THE CARIBBEAN*

In recent months, some Latin American and Caribbean governments have conceived the desire to promote RA. This was unthinkable only five years ago ! Why this sudden change? The situation and perspectives of RA in Latin America and the Caribbean are analysed below.

Despite less than ten years of existence, RA has become an important concept on the contemporary rural development scene. About fifteen years ago, some institutions became aware of the obstacles encountered by small farmers once their crops were harvested : they experienced losses during storage and transportation, and difficulties in selling their produce and in diversifying markets. If they were to be helped to stay on the land, it was not enough to give them the means to produce more and better. They also had to be helped to do away with the chain of middle-men who usually pocketed much of the added value. The answer was to help those peasants to achieve at least partial control of the processing and commercialization of their products.

Several isolated, empirical experiences were then attempted :

- rural Andean cheese dairies in Peru and Ecuador, with Swiss assistance ;
- manioc-drying units on the North Atlantic coast of Colombia, piloted by the International Centre for Tropical Agronomy (CIAT) ;
- "rural agrobusiness models", by the Center for research in food technology (CITA) in Costa Rica.

In October 1983, a relay was set up with the help of French technical assistance, thanks to a RETADAR, an appropriate food technology network for the development of rural agrobusiness. Its goal was to encourage the exchange of information and experience on the theme of the development of rural agrobusiness. It soon was able to publish a newsletter, open a question/answer service and organize international seminars. A dynamic movement in favour of RA was launched, courses were planned, research was conducted to define a framework for action, valorize what had been learned, determine methods for identifying, promoting and evaluating RA projects. Last, national networks were set up in Chile, Ecuador and the Dominican Republic.

In 1989, the national networks, financeers and national institutions involved decided to unite and to formally integrate their efforts to promote RA by founding a cooperative programme, PRODAR, a programme for the development of rural agrobusiness in Latin America and the Caribbean. The goal was the reinforcement of rural agrobusiness and of the institutions connected with it in order to strengthen it and improve its competitiveness on the market, to

* By F. BOUCHER (IICA).

encourage the creation of new units so as to generate jobs and income in rural areas and to improve the living conditions of peasants and of rural communities. One other objective of PRODAR is the formulation of proposals for strategies and policies furthering the development of RA.

THE PHILOSOPHY OF RA

Gradually, the technical/scientific community participating in RETADAR and later in PRODAR developed a frame of references based essentially on field experience rather than on theories. A definition was proposed : "rural food-producing agrobusiness or peasant food-producing agrobusiness may be defined as an activity which enables small producers to enhance the value of their production by performing a series of post-harvesting activities further along the food chain, possibly encompassing storage, processing, packaging, transportation and commercialization of products.

The size, scale of production, investments and productivity of these enterprises should correspond to the logic and situation of the peasantry. They should contribute to the improvement of the local diet and nutrition, and also help to strengthen peasant organizations and the national economy."

This definition should be extended to include small-scale fishing and other non-food-related activities such as crafts. It should also be flexible enough to encompass different types of products and of enterprises depending on the location, the forms of property and of markets, as well as the objectives of rural development and of the protection of the environment.

A number of miscellaneous elements, somewhat like a list of ingredients which make a thick, tasty sauce when mixed in proper amounts, provides a better understanding of what the RA system is. They include :

- the product : raw material, manufactured products, technology used and quality control ;
- how the enterprise is run : peasant organization, functioning/management, commercialization and promotion of products ;
- support received : financing, research/development and training ;
- the institutional environment : its organization and the role of the government ;
- the location, literally speaking : availability of energy, water, roads, etc., and also the social, economic and cultural environment.

This frame of reference has been enriched by a systematic, entrepreneurial optic, the objective of which is the concrete, appropriate solution of the problems encountered after harvesting. For instance, when producers lose fruit, the response should no longer be purely technological - that is, the development of marmelade production ; it should be entrepreneurial, with the creation of a small unit for the processing and commercialization of fruit. We are no longer speaking about appropriate technology, then, but about appropriate enterprises, with an attempt to reconciliate entrepreneurial and peasant logics and problems.

For the sake of efficiency and for a better comprehension of RA, traditional, or native RA has been distinguished from RA induced by development projects.

In conclusion, several of the guidelines included in the PRODAR promotion programme should be underlined. PRODAR's policy is based on the need to give added value to peasant production so that the producers will be the main beneficiaries of their work ; it attempts to distinguish between traditional, established, native, ancestral RA and RA induced by development projects. It wishes to spur the development of specialized supportive services for traditional RA and to encourage the creation of small enterprises in rural settings, with emphasis on technology, quality control, organization, management and commercialization. It works toward the constitution of sets of integrated RA systems, through transferral actions starting from a pilot unit implanted in a rural area. PRODAR is interested in the use of appropriate methods for the identification, development and evaluation of projects : such methods are based on the active participation of peasants, with their specific identity. Last, priority should be given to the implantation of RA in those countries whose political leaders endorse these concepts.

THE REALITY OF RA

One major contribution of RETADAR and PRODAR to the existence of RA has resided in the consolidation of knowledge about this sector, so that its difficulties and potential might be more accurately measured. This understanding was acquired through specific studies and experiments, country-by-country diagnosis of RA, and technical meetings with project officials. The main results are discussed below.

THE ENVIRONMENT OF RA

It is important that RA be situated in the broader framework of agrobusiness as a whole. Indeed, the soaring development of this powerful economic sector dates back to 1950, with the massive exportation of traditional farm crops such as coffee, sugar cane, bananas, meat and cocoa. At present, this is an ill-defined category in Latin America and the Caribbean, particularly where governmental agencies and legislation is concerned ; clearcut government policies are lacking, and above all, responsibilities are divided between a number of ministries and institutions. The dramatic situation of RA may be explained by four basic facts.

Lack of reliable statistics

The lack of reliable statistics is crucial, as illustrated by the case of Costa Rica. Official data (provided by the Central Bank and the Ministry of Health - 1989) mention the existence of 66 small-scale sugar-processing units (making panela, tapa de dulce, raspadura), whereas an initial survey (Massis, 1989) has already counted 230 such units in the Puriscal region alone. The situation of rural cheese dairies is just as striking, since 200 have already been counted, whereas only 25 of them are officially registered with the ministry of health, and are therefore inspected. It is not surprising, then, that severe food poisonings are periodically reported in the press. Furthermore, most RA are a part of the informal economy, which is extensively developed but paradoxically attracts little interest. The arrival of cholera in Central America will certainly change this attitude and draw aid to this sector.

Priority to technology

In the food-producing area, most efforts concentrate on technical and methodological improvements, but do not deal with the problem of rural development. However, the recent creation, in Colombia, of a centre for research and for the improvement of panela (cottage-industry-made cane sugar), with the help of the Netherlands (CIMPA) is noteworthy. Other research institutions such as the CIAT in Colombia, the INCAP in Guatemala and the CITA in Costa Rica have contributed to the promotion of several induced projects. In addition, the Canadian CRDI has provided support for research programmes dealing with post-harvest techniques for Andean agricultural produce, in collaboration with the universities of Cuzco, de Puno and d'Arequipa in Peru, and with the University of Ambato and the INIA in Ecuador (1).

Training needs

The lack of appropriate training, both among professionals and technicians and among peasants, has been pinpointed from the outset (the first RETADAR seminar in April 1985, in Costa Rica) as one of the main obstacles to the development of RA. With the creation of ERTEC courses, RETADAR, and later PRODAR, set up a first short training structure to be rapidly followed by longer training courses for higher-level technicians (the FUNDACEA one-world agricultural college, in Venezuela) and for specialization (INCAP in Guatemala, the University del Valle de Cali in Colombia, GIA in Chile). Some extremely interesting methods for training peasants have been introduced in some of the PRODAR member projects. These include training in the natural drying of manioc (in Colombia), for which a first pilot unit has been set up in what seems to be a solid cooperative, with the very active participation of everyone involved. The participants in turn will play a decisive role in the creation of other peasant teams. No-one is in a better position to convince a peasant than another peasant. This is definitely one of the main explanations of why this project is so successful. In less than five years, 40 units have been set up in Colombia, 40 in Ecuador and close to one hundred in the Brazilian Nord-Este.

Lack of financing

When groups of farmers attempt to organize an RA, they come up against another enormous obstacle : financing. Indeed, when their dossiers are submitted to the banks, the bureaucratic hurdles tied to the absence of backing often get the best of the applicant's patience. There actually are no appropriate credit lines for this type of activity. Charitable financing is the only type available at present, but working capital is often lacking, and prevents many projects from getting off the ground.

TRADITIONAL RA

Little is known about this sector, but the first investigations conducted by PRODAR have provided some information.

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(1) Appendix 10 shows the meaning of the initials.

A wealth of products

Well before the colonization period, peasants were most skillful in developing their time-tested native food crops and crafts. Some products which we seem to have discovered recently such as rocou, for food colouring (achiotl in Aztec), or by-products of maize were actually well known to the Incas, Aztecs and Mayas. Others such as panela, home-processed sugar-cane, were imported by the colonizers (see table 1).

Number of units

Few statistics are available on these units at present, but the first findings are promising, and contradict those people who considered RA a marginal, anachronistic sector devoid of economic impact. A statistical study of RA conducted ten years ago by the FIBGE in Brazil recorded the existence of 2,600,000 small processing units for farm produce and animals. In 1985, the REDAR-CHILE network census revealed the existence of 58,700 farm processing units in Chile. More recently, PRODAR was able to establish estimations for certain regional products. Some findings (see table 2) indicate the importance of panela in Colombia and Central America, of honey in Mexico and Peru, of coffee in Mexico, Colombia and Central America, and last, of the nixtamalization of maize, necessary for the preparation of "tortillas", or maize pancakes, a staple food in Mexico. These few figures on the number of units do not provide enough information to comprehend the trend. For example, it would be interesting to analyse why the number of panela-producing units in Colombia dropped from 57,000 in 1970 to only 30,000 in 1990 (Riveros, 1988 and 1990). And what about the constantly rising number of units involved in the first phase of coffee-processing in Colombia and Central America?

Comparison with big business

In big business, coffee is the main crop, far ahead of cocoa and panela. The available figures make it possible to compare RA and large manufacturers ; the latter is comprised of 1,500 units, creates 113,000 new jobs each year and employs 463,OOO individuals, as against 420,000 for RA. Productivity ratings show that workers are more productive in the large concerns, but that the cost of investments per position is much lower in RA. This shows that industrial manufacturers tend to use expensive, energy-consuming modern technology, whereas RA, on the other hand, resorts to more appropriate, less expensive technology requiring many relatively unspecialized workers.

INDUCED RA

Between 1984 and 1986, the analysis of an initial group of projects identified by RETADAR (cf table 3) made it possible, for the first time, to devise a conceptual framework, to benefit from experiences and to create a methodological tool for the development of RA projects. Several of these have made extremely enriching contributions ; thanks to this impetus the other RA in the area were consolidated and considerably encouraged.

The natural manioc-drying project (CIAT and national agencies) emphasizes peasant-to-peasant training as well as the self-reproductive capacity of manioc-drying units, thanks to which real

Table 1
Examples of traditional RA systems

Sugar cane	Panela, tapa de dulce, chancaca (home-made sugar) Home-made sweet
Maize	Tortilla (thin pancakes) Arepa (starch balls) Chicha (fermented drink)
Andean cereals and grains	Quinua and tarwi (Andean grains), mixed flours
Manioc	« Farinha de mandioca » (semolina) Lean starch Manioc chips for animal fodder Cassave (flat cakes)
Potatoes	Starch Papa seca (dried potatoes) Chuño negro Chuño blanco : tunta, moralla
Spices and food colouring	Rocou/Bixine Cocheneal/Red cocheneal Pepper, ginger, etc.
Vegetables	Sauerkraut Encurtidos (pickles)
Fruit	Pulp Jellies, marmelades Fruit paste Dried or preserved fruit
Plantain banana	Chips Flour
Milk	Cheese Concentrated milk
Bee-keeping	Honey
Camels (Andes) and sheep	Wool Charqui (dried meat)
Coffee processing	Coffee grains
Fishing and fish-farming	Dried, salted and smoked fish

Table 2
Rural agrobusiness in Latin America

Case	Country	Réf. Year	No. units	Production (MT/year)	Jobs
Panela (cottage industry sugar production	Colombia	1970	57,000		
Bee-keeping	Peru	1988	10,000	2,800	25,000
Camels	Peru	1984		6,200* - 2,500**	170,000
Coffee-processing	Costa Rica	1980	32		
Quinua - processing	Bolivia	1985		21,000	150,000
Manioc starch	Colombia	1987	5,000	40,000	50,000
Guava paste	Colombia	1987	500		
Concentrated milk sweets	Colombia	1987	250		
Coffee-processing	Nicaragua	1984	112		15,000
Nixtamal for tortillas	Mexico	1979	15,500	5,000,000	35,000
Cotton - ginning	Mexico	1980	100		2,700
Coffee-processing	Mexico	1981	700	1,000,000	500,000
Sugar cane honey	Panama	1981	4,000		
Panela	Panama	1981	1,700		
Plantain banana flour	Colombia	1981		23,000	
Pork fat	Brazil	1980	698,223	71,190	
Manioc flour	Brazil	1980	501,785	1,459,850	
Meat derivatives	Brazil	1980	393,554	26,709	
Cheese	Brazil	1980	216,731	74,185	
Bee-keeping	Chile	1989	18,639		
Cidre	Chile	1989	11,600		
Dried fruit	Chile	1989	8,900		

* Meat.

** Wool.

Source : . CANDICOM. La agroindustria en América latina. Bases para un plan de fomento. Bogotà, 1988.

. FIBGE. Censo de pequeñas agroindustrias rurales. Brazil, 1980.

. REDAR Chile. Catastro de agroindustrias rurales, 1989.

networks of small enterprises , with computerized follow-up of financial management and an ability to generate new activities could be set up in Colombia, Ecuador and Brazil.

In the rural cheese dairy in the Ecuadorial Andes (Swiss assistance and national agencies), the method for transferring technology was based on an extremely serious feasibility study, adapted to the living conditions in those outlying Andean regions and taking technical, social and economic factors into consideration. These

Table 3

Projects which generated other RA

Model rural agrobusinesses in Costa Rica (CITA)
Agrobusiness centre, Arrobleda in Colombia (FUNDAEC)
Natural manioc-drying project in Colombia (CIAT-DRI-SENA)
Rural cheese dairies in the Andes - Ecuador (COTESU-FUNDAGRO)
Andean intercommunal centres - Peru (U. DE CUSCO - U. DE PUNO-CIID)
Improvement of industrial techniques in coffee-processing cooperatives in Guatemala (ICAITI-CIID)
Paul Gonzales Cooperative venture in Nicaragua (LABAL)
Vinegar project, Nicaragua (LABAL)
Rural agrobusiness canneries La Concepcion in Nicaragua (LABAL)
Industrial cooperative project (PROCAI) in Guaymitas, Honduras (CEPROD)
Ideagro project in Peru (Centro IDEAS)
Agro-chemistry programme in Cochabamba, Bolivia (CORDERO - U. DE COCHABAMBA)

projects were rapidly able to provide substantial income to dairy farmers in marginal areas, to produce high-quality cheese and to generate their own marketing network (shops carrying the project's sign, in large cities).

The model rural agrobusiness project in Costa Rica (CITA) has afforded valuable information on the improvement of native technologies such as the extraction of bixin (natural orange food colouring in rocou), the farmers' introduction to modern technology such as the processing of fruit, a method for launching new products on the market and the introduction of innovative packaging. Two enterprises have been highly successful : first, Coopefruta, which processes rocou and produces spices, and secondly, Coopedelicias, which produces fruit concentrates. There are also several innovations in the distribution system (the model firms created their own brand, Fruvel, commercialized in supermarkets) and two major indirect effects, including the development of a firm making equipment for the food industry and the creation of enterprises copied from the AMA (the Acosta women's group) and UTRAIPZ models.

The IDEAGRO project in Peru (the Centro IDEAS NGO) took advantage of a laboratory product invented by the CIP (International Potato Centre), to develop a series of mixed grain flours of Andean origin, produced in a pilot enterprise, and launched them on the market. The results were positive with respect to nutrition, methods for creating markets for new, popular foods and appropriate marketing. Its limits were revealed when its reproduction turned out to be impossible. The legal form of the enterprise is also interesting : it is a limited liability company owned by an NGO, since Centro IDEAS wished to personally experience the difficulties encountered by small companies.

Several projects have been inventoried in Honduras : first, the Hondupalma industrial oil-processing plant. Several peasant cooperatives with oil-palm tree plantations went into partnership in a raw palm-oil producing unit. This large company is competitive, on a market dominated by the transnational American corporations. This experiment shows how small farmers may generate a major, exporting activity for a product such as oil, provided they unite.

Next, there is the microrice-processing project (CEPROD) ; three cooperatives of small rice planters with difficulties selling their rice joined their forces, thanks to the support of an NGO (CEPROD), and built a small rice-processing unit. Now that they have bought a Japanese machine which shells, processes and sorts the rice in a single operation, these cooperatives are able to commercialize their rice themselves, in small packages. These Honduran peasants are no longer at the mercy of middle-men or of processing companies.

In Bolivia, the "Agroquimico" project (private initiative, Saint-Simon university and the Cochabamba development corporation) has made eucalyptus, mint and pyrethrum commercializable, by integrating these local products in a regional development process. These promoters developed a simple extraction method, after which small units producing raw essential oils were set up, with the collaboration of the farming communities, and last, a small oil refinery was built on the university grounds. A second phase aimed at solving commercialization problems launched products based on essential oils on the market (sweets, drugs, insecticides, etc.). The project was immediately profitable, since within a matter of weeks the peasant communities were not only able to reimburse the loans they had obtained to purchase the extractors, but above all, Bolivia, formerly an importer of eucalyptol, now exports it.

In 1988, other projects were added to this first group associated with RETADOR as early as 1984, and they now participate in PRODAR's research, development, training and information exchange activities. Here are two examples.

The San Dioniso project in Nicaragua (PRODESSA, an NGO) has two RA components : first, to enhance the value of local farm products, the project encouraged the creation of a small RA for the processing of fruit, and of tomatoes in particular. It earned a position for itself on the local Ketchup, preserved fruit and jelly market. Its success was mostly due to the simplicity of its techniques, the quality of the merchandise and good management. Secondly, to improve grain conservation, the project introduced an extremely simple, very inexpensive home silo, produced by local crafts people. The increasing demand for these silos is the best proof of their success.

The 4 Pinos cooperative in Guatemala, which was experiencing difficulties in commercializing its vegetable production, consulted the INCAP. The solution adopted was the drying of herbs such as parsley, and this activity led to the development of an enterprise. A recent survey showed the socio-economic impact of this processing unit on the community of small growers, but it also showed that its success was mostly attributable to the dynamism of its director and to his exemplary management.

SOME POINTS FOR THE SOCIO-ECONOMIC EVALUATION OF INDUCED RA

Case studies have shown that no project is viable if it is not economically profitable, and this depends above all on the added value : "economic profitability is based on the production of wealth, that is, the creation of added value". This may be achieved in several ways : either by the transformation of a raw material such as milk into cheese, which is a very expensive product, or by selling very large amounts of an inexpensive finished product such as dried herbs, or again, by creating new products or substitutes for other ones, as is the case for dried manioc chips or powdered rocou, for instance.

The success of an enterprise depends on commercialization : what is produced must be sold. This is not easy for RA, since it requires a combination of quality, quantity and competitive pricing. Furthermore, they do not have access to modern commercialization circuits. Alternatives must therefore be found. These may include direct sale, from producer to consumer (on markets, in their own shops), institutional markets (national food programmes), segments of the market for luxury items (cheese) or for natural and diet products (rocou, panela, etc.), the creation of their own brands (fruvel in Costa Rica), etc.

Other factors are instrumental in making small RA profitable : these include the use of simple, inexpensive technology, easy to maintain and locally produced, an appropriate scale of production and staggered investments depending on profits. Another very important point is the use of indigenous raw materials.

Examples of successful projects show that social impact is considerable only when success has been secured. This of course depends on how profits are used. These may be divided up between partners in the project, in the form of money income. The impact is individual, here, and the results will depend on how the funds are used. They may be used for social investments such as insurance, scholarships, community improvement projects, etc. The partners in Ecuador's cheese dairies are covered by personal insurance ! The profits may contribute to the community's socio-economic development : part of the profits are used to finance new activities, which in turn will create further wealth. In Salinas, in the Ecuadorial Andes, some ten small enterprises were set up over a 5-year period with the help of the cheese dairy.

A study of the socio-economic impact of projects finds other results as well : income, of course, but also direct and indirect employment, community activities (credit systems, purchasing cooperatives, loaning of farming equipment, etc.) and also the improvement of living conditions (roads, electricity, communications, etc.).

Last, the influence of several of these projects on the micro-regional economy (in the case of cheese dairies) and even on the national economy (dried manioc replaces sorghum, an import in Colombia) should also be emphasized.

RA, CONFIDENCE IN THE FUTURE

Interest in the development of RA has suddenly awakened, as evidenced by the decision of ministries of agriculture (the joint interamerican agricultural association) to include RA and PRODAR among the priorities of the new agricultural reactivation plan for Latin America and the Caribbean, on the one hand, and on the other, by requests from several countries for support in establishing a strategy for the development of RA. There are four reasons for this interest.

RA has proved its value

Despite the negative overall context and its marginal status, except for some high-priority economic sectors such as coffee, bananas, cocoa and meat, RA has been able to survive all sorts of adversities. The proof is the number of rural enterprises now well known. The results of the first decade of development of induced RA are specially promising, as shown by project evaluations by members of PRODAR. The international agencies view the 1980s as lost years for the development of these countries : they were not lost for everyone, it would seem !

However, modesty is the best policy, and RA should be assessed accurately, its limits clearly determined and above all, it is important to act fast, because the peasants are leaving the countryside !

The needs are great

RA is relevant to a large peasant population, since close to 100 million individuals need more income to survive, and tend to leave the countryside and to crowd into the squatter towns. It is true that indicators of poverty and malnutrition show these to be worse in rural areas than in the cities. Peasants possess an enormous potential, however, since they produce 40 % of the food consumed in their region and 30 % of exports. Helping peasants means helping city-dwellers as well ! Huge metropolises are now being consolidated in Latin America (Mexico City, Lima, San Pablo, etc.), and they require new foods and the development of new food distribution circuits. The motto of present-day governments should be : "help the country to feed the cities".

Opening a space in the transnational agrobusiness system

The food agrobusiness in this part of the world is characterized by the lack of appropriate policies for its harmonious development and the consolidation of a transnational agrobusiness system, as described by Gonzalo Arroyo. Consequently, the present concern is with positioning small and medium-sized industries within this context.

A new world economic order

The international financial agencies are now imposing the implementation of structural readjustment policies based on free trade. While these may have truly beneficial effects on macroeconomic indicators, they have drastic social repercussions, on the work and life of peasants in particular. It is a fact that these policies are based on the belief in striving for comparative advantage and in the elimination of guaranteed prices and subsidies. If their negative effects are to be avoided, a restructuring of the food chain is needed, so that peasants will benefit from the added value accrued from their products. By helping them to process and sell their products, RA should provide interesting answers to this problem. The dilemma resides in the need to transform peasants into small businessmen before they disappear !

Peasants have :

- the ability to produce ;
- unused manpower ;
- efficient forms of organization ;
- knowledge about the small-scale processing of agricultural products.

Peasants lack :

- the entrepreneurial logic ;
- specialized information, particularly in trade and modern technologies ;
- adequate financing ;
- a favourable environment ;
- sufficient knowledge of company management ;
- well-established ties with the market economy ;
- homogeneous raw materials, of industrial quality ;
- satisfactory infrastructures ;
- government support.

Peasants need help to :

- create enterprises ;
- create a favourable environment, with government support. This means that peasants must be given help with their projects, and trained.

PRODAR has decided to take up this challenge.

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CASE STUDIES

RURAL CHEESE DAIRIES IN SALINAS, ECUADOR*

The present case study is taken from a more comprehensive study (1) conducted by PRODAR. The latter was conceived as a response to the desire expressed by members of the programme to dispose of an objective, in-depth analysis of the existing rural agrobusiness projects in the region. The objective was to capitalize on the different experiences, and to draw lessons that would be helpful in setting up new projects.

SALINAS' NEW FACE

Salinas is an Andean town located in Ecuador, at an altitude of 3,500 meters, in the province of Bolivar, 260 km south of Quito. The district encompasses areas located at altitudes ranging from 600 to 4,200 meters, and is quite mountainous. Traditional farming activities are the raising of dairy cows, on large ranges covering the natural pastureland of the region, and subsistence farming.

It is hard to say that living conditions in Salinas have changed because of the cheese dairy only. In fact, the present state of affairs was achieved through a complex process which accompanied the development of the cheese dairy and of various other activities. No study has been made on the situation before and after the project. The only information available is the population's own judgements as to the evolution of their standard of living, the opinion of engineers who worked in the area and familiarity with the local situation, which makes an immediate appraisal possible.

No more than 20 years ago, houses were all made of earth, with a thatched roof, the traditional architecture of Ecuador's Andean region, known as "choza" and still used extensively throughout the area. At present, almost all of Salinas' houses are two-storey brick buildings. A project for building new homes for local young people who are setting up a household is under way. A hotel is under construction in town, along with several larger, more comfortable homes. This is indicative of a rise in the standard of living, and of the population's desire to improve its housing conditions. The town is now equipped with running water, electricity and a passable road for vehicles.

No study has been made of the nutritional situation in the area, but we do know that the consumption of cheese in the region has tended to rise gradually but sharply since the project was implemented. It is a fact that people formerly ate little cheese, with the exception of "quesillo", home-made soft cheese, usually made for sale rather than for home consumption. The town priest was particularly instrumental in promoting this dietary change, since he distributed cheese to the poorest families. Gradually, the local people - that is, the dairy farmers themselves - began to purchase increasing amounts of cheese for their own consumption, thus

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(1) The study began in December 1989 and was completed in December 1991. It was conducted by GRET, a French NGO and financed by the French ministry of research, a Colombian NGO - CELATER - and a private, Franco-Swiss foundation, the Fondation pour le Progrès de l'Homme.

*** By Florence TARTANAC (INCAP).**

improving the diet of children in particular and of their family as a whole.

These improvements are actually a reflection of the totality of the economic activities which have been developed in the village since the cheese dairies were set up. There are now 7 cheese dairies within the district of Salinas, in addition to the one located in the chief town itself. These are scattered in the surrounding villages. Other sectors such as production and service activities are also expanding.

Production includes one relatively modern natural wool-spinning mill, which collects all of the wool produced in the area, the knitting of "typical" sweaters by women, a small-scale pork-butchery that sells its hams and sausage in Quito, á button factory and a craft production of "tagua" (also known as "plant ivory"), a cabinet-maker, a bakery, mushroom-drying, a bottling plant for natural mineral water and a trout farm.

Service activities include the creation of a shop selling farm produce, groceries and agricultural input needs, a farm credit service supported by the savings and loan cooperatives in existence in each community. Families have access to technical assistance in animal-husbandry and farming, provided by technicians from UNORSAL, the Salinas union of organizations. Alongside of the promotion of projects furthering farming, reforestation and the control of soil erosion, there are facilities for purchasing farm land from the district government or from neighbouring haciendas. Health has improved through the creation of a clinic and the permanent presence of a doctor. There is practically a complete educational system, going from nursery school to high school.

In 1989, about 95 % of families in the Salinas district had one or several members affiliated with one of the region's many organizations, including savings and loan cooperatives, cheese dairies, milk and farming cooperatives. The organization which groups these grass-root cooperatives, UNORSAL, therefore represents practically the entire population. The evolution of the number of members of the cheese dairies only for the country as a whole is shown in figure 1 : in 1989, there were nearly 1,000 associate producers, representing an approximate number of beneficiaries exceeding 3,000 families.

The people who benefit from the cheese dairies are the region's small farmers, who devote themselves exclusively to farming, have low incomes and precarious living conditions. Although there was a tendency, even before the creation of the first cheese dairy, to extend dairy-cow raising, the fact that the town is located rather far from its potential markets considerably limited the development of this activity. The size of animal farms in the region ranges from 5 to 10 hectars for small producers to 100 hectars for the haciendas. 90 % of small producers own their land and 10 % rent it.

Since the implementation of the project, "salineros", and especially the landless peasants, began to buy land from their former bosses.

The peasant organizations bought all of the land that was for sale in the district, then sold tracts to the associate producers, on an easy payment plan. All of the land that cannot be farmed is now given over to dairy-cows. This is indicative of the impact of the cheese dairies on this productive sector.

As a rule, participants in the project possess between 1 and 10 cows, with a daily milk production of 3 to 15 liters per cow. Members of the cheese dairies bring in an average of 1 to 20 liters/day. For the entire Salinas region, it is estimated that milk production rose from 500 liters a day in 1978 to 3,000 liters in 1988, thanks to the stimulation afforded by the project.

While the impact on dairy-cow farming is visible, the impact on the producers' income is not as easy to measure. It is clear, however, that the fact of guaranteed milk sale to the cheese dairies means that peasants can rely on some income. For small producers who bring in 20 liters of milk a day, this income provides the possibility of maintaining their farming activities and avoids having them abandon their land and go off to seek wage-earning work. Although this dairy farming keeps them on the land, it is insufficient, and subsistence farming is an indispensable complement if they are to survive.

For the middle-sized or large farmers who sell from 20 to as much as 120 liters of milk daily, the income generated by the good price they get for their milk enables them to put something aside, and increase production to the point where they can employ workers. These differences in income naturally foster greater social contrasts, unless there is some compensatory process, such as the fact that the cheese dairies consistently attempt to give preferential treatment to the poorest peasants.

As for employment, in 12 years the existing organizations have generated close to 250 community-sponsored jobs in different fields. The cheese dairies alone represent 25 jobs, including 7 in Salinas. UNORSAL, in turn, employs 125 people including 56

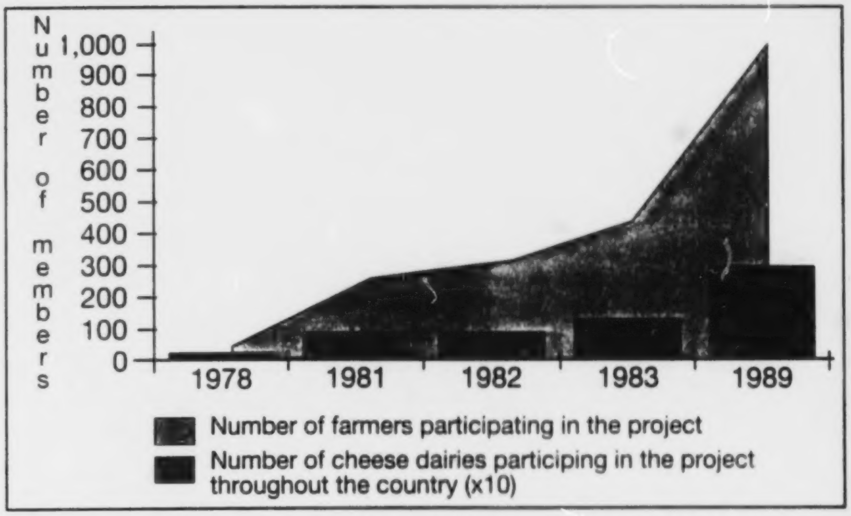

Figure 1 : Evolution of the number of cheese dairies and of dairy farmers participating in the project throughout the country

promoters, the others being workers employed elsewhere than in the cheese dairies.

CHEESE DAIRIES ARE PROFITABLE

There is no doubt that this project has had a tremendous social impact on the entire area comprising the Salinas district. However, although it is difficult to sort out the specific contribution of the cheese dairies alone to this development, they may be said to have acted as catalysers in the development of Salinas, since they are the first, and above all the most worthwhile productive activity in the region.

Indeed, the cheese dairies are particularly profitable ventures. The financial evaluation conducted for the Salinas cheese dairy for the 1989 budgetary year shows that for a turnover of 90,000 US$, the net profit made was 27,000 US$, or close to 30 %. The ratio of added value to production was 37.5 %, thus showing that the processing is quite elaborate and considerably increases the value added to the raw material. The rate of self-financing, which also reached 30.3 %, is another indication that the enterprise is profitable.

This is explained by the low cost of production, not only of the raw material (milk), but of the manpower as well, and of the shipping of the cheese, done by a lorrey belonging to UNORSAL. The cooperative is intent on limiting costs, especially the price of milk and wages, which are practically the same as on the marketplace, so as to avoid disparities between large and small dairy farmers and between inhabitants of Salinas. The profits are not divided up among the members of the cooperative : they serve as capital for the Salinas savings and loan cooperative. Thanks to this fund the members of the cooperative have access to credit at a low interest rate for the improvement of their farming production, and more specifically for their milk production.

This capitalization of profits is of course definitely a positive aspect for community development, but it may become dangerous if the cooperatives do not improve their managerial capacities. It is a fact that the great profit-generating ability of the cheese dairies enables them to cover their working capital and the necessary small investments easily. However, the lack of accurate knowledge of production costs and of the main expenses, as well as the lack of an explicit policy for the management of their capital are two aspects which limit the actual impact which this profit could represent for the financial situation of the enterprises.

While the project's main objectives are definitely social in nature, such as the distribution of credit at low interest rates for members of the cooperative, it is a fact that if the cheese dairies were more businesslike in their management they might generate more income and above all, achieve a degree of stability and consolidation which would enhance the future security of their productive activity as well as of socially useful works and enable them to grant more credit.

An analysis of the production yields some indication of the amount of milk processed by all of the Salinas district cheese dairies, as well as the degree of use of the facilities. It is noteworthy that practically all of the cheese dairies work below capacity, especially in the summer, when milk production is at its lowest (see table 4).

Table 4
Processed milk flow in the Bolivar province cheese dairies

Name of the cheese dairy	Theoretical capacity (l/day)	Actual milk flow (l/day)	Number of dairy farmers	Types of cheese produced
Salinas	2,000	900 to 1,500 (1989)	140 (1989)	Dambo, Tilsit, butter, swiss
Apahua	600	300 to 430 (1987)	25 (1982)	Andean
Chazojuan	600	350 to 450 (1987)	25 (1982)	Soft white, Provolone
Pambabuela	600	100 to 200 (1989)	23 (1989)	Andean
La Palma	600	180 to 350 (1987)		Dambo
Pumin	400	300 to 400 (1989)	35 (1989)	Soft white, Andean Camembert
Arrayanes	400	100 to 140 (1987)		Andean
Yacubiana	200	140 to 200 (1987)		Andean

A graph (see figure 2) shows the evolution of production from the start of the project until the present time.

Cheese production depends on the evolution of the productive capacity, and more specifically on the equipment and technology used in the dairy. The latter is Swiss in conception, but adjusted to the Andean context. The facilities are simple, and the equipment is all produced within the country and can be repaired in the town mechanic's shop.

The philosophy of the project does not involve the use of sophisticated material, and above all, it views the establishment of several small cheese dairies as preferable to a single, larger capacity plant. This is in compliance with two objectives : first, limiting the cost of transportation of fresh milk, and keeping the supply area down to a relatively small radius so as to improve control of quality. Secondly, the existence of a cheese dairy in their community is more stimulating for producers and for the community at large than the simple fact of delivering their milk to a far-off cheese dairy. But cheese dairies may change as a result of increased milk production within their own area. The Salinas plant, for instance, began with a daily capacity of 300 liters of milk (the minimum, beneath which a cheese dairy is not profitable), and gradually expanded to its present capacity of 2,000 l/day.

As for commercialization, the project has definitely been successful. From the outset, the Swiss assistance agency insisted that commercialization be given priority among the project objectives. Furthermore, there was no competition on the matured cheese market in Ecuador, in 1978. For these two reasons, Salinas cheese easily earned a reputation of being the best (if not the only) Ecuador-produced matured cheese on the market. The cheese dairies now own a shop in Quito, which sells much of the production of Bolivar province, as well as of other cheese dairies connected with the project. And in 1989, a new shop opened in Guayaquil, so as to satisfy other markets and provide an outlet for the growing stocks.

One major factor in this commercial success is of course the quality of the cheeses. These are generally qualified as good to excellent by the Swiss engineers. However, some problems do arise occasionally, causing the shop to return certain cheeses. These quality gaps have two causes : the quality of the milk and the cheese-making process. The policy with respect to the quality of milk is that the cheese dairy accepts whatever is brought in, even if the quality is unsatisfactory. This attitude is of course prejudicial to the cheese dairy and to the quality of the cheese ; however, the members of the cooperative and the engineers on the project view this as a necessary phase, to draw as many producers as possible into the cooperative, where they gain access to training and technical assistance.

The problems linked with cheese-making usually involve use of faulty procedures by some cheese-makers, such as the improper use of starters, poor control of the quality of the milk or untimely

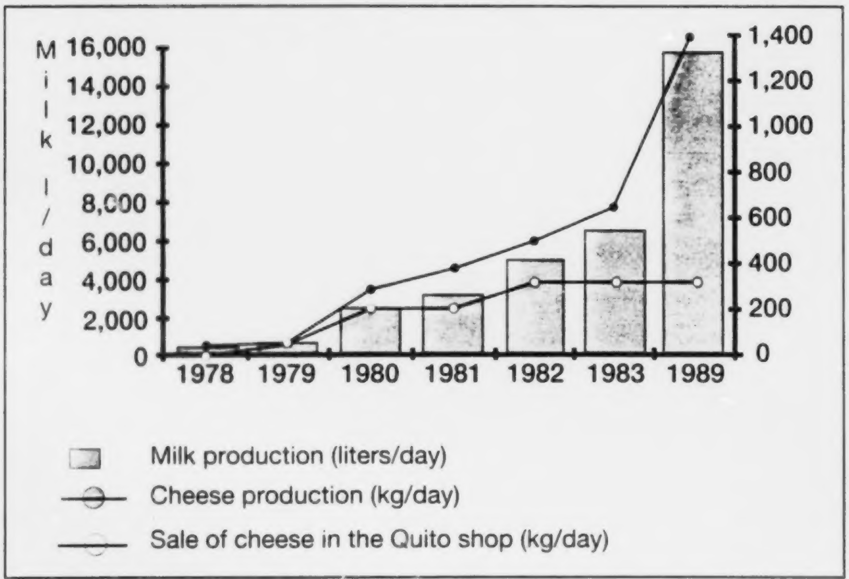

Figure 2 : Production of milk and cheese, sale of cheese by all of the project's cheese dairies

absence of the cheese-maker. There are several possible explanations of this situation. In the case of new cheese-makers, it is mostly due to a lack of training, since they sometimes are not trained directly by the Swiss engineers, but by another cheese-makers, and there may be loss or deterioration of information along the way. In addition, some of the more experienced cheese-makers may fall into a routine leading them to neglect some important production phases.

In the opinion of one Swiss engineer, the reason behind this is the lack of a cheese-making tradition, which fosters certain qualities such as punctuality, conscientiousness, love of quality and of cheese. However, cheese-makers apparently are gradually acquiring this tradition. Those of them who are fathers view themselves as exemplary : they speak with pride of their training and their diplomas, and try to motivate their children so that they will follow in their footsteps, in the love of this work.

What seems at first glance to be a simple technique actually requires a degree of conscientiousness which neither cheese-makers nor, in fact, milk producers find it easy to achieve.

An analysis has measured the economic impact of the project in its sphere of influence. The situation in the region in which the project is located was compared with a reference situation seemingly similar to the one prevailing prior to the project. The assessment considered the Salinas cheese dairy as well as the indirect effects connected with this activity, such as the income of dairy farmers and related activities such as the UNORSAL tractor and lorrey. The table for the reference area shows the same number of dairy farmers, but these sell their production on the fresh milk market, with a resulting 20 % deficit in production (no technical assistance) and a 20 % lower price paid for the milk as well (difference between the price paid by the cheese dairy and the amount offered by Nestlé in the area).

The findings (see figure 3) corroborate the great economic impact of the project in the Salinas region, particularly through the direct income generated by the cheese dairies. The dairy farmers have higher incomes than in the reference situation, but this difference is offset by the higher cost of agricultural inputs brought in from other areas. As for wages, there are fewer farm labourers, owing to use of the tractor purchased by the cooperative. This decline is balanced out by the jobs created by the cheese dairy - in terms of value, at least, which does not necessarily mean that the number of jobs is the same. Furthermore, a single cheese dairy is considered here, whereas the additional jobs created by the other activities should be taken into account if the impact of the project as a whole is to be considered.

In short, the economic impact is mostly due to the cheese-making activity, which generates considerable added value, in the form of earnings for a small part, the major part as profits ; in any case this added value remains in the area. Further, as opposed to milk production, this activity does not require much spending outside of the area, because of its appropriate technology.

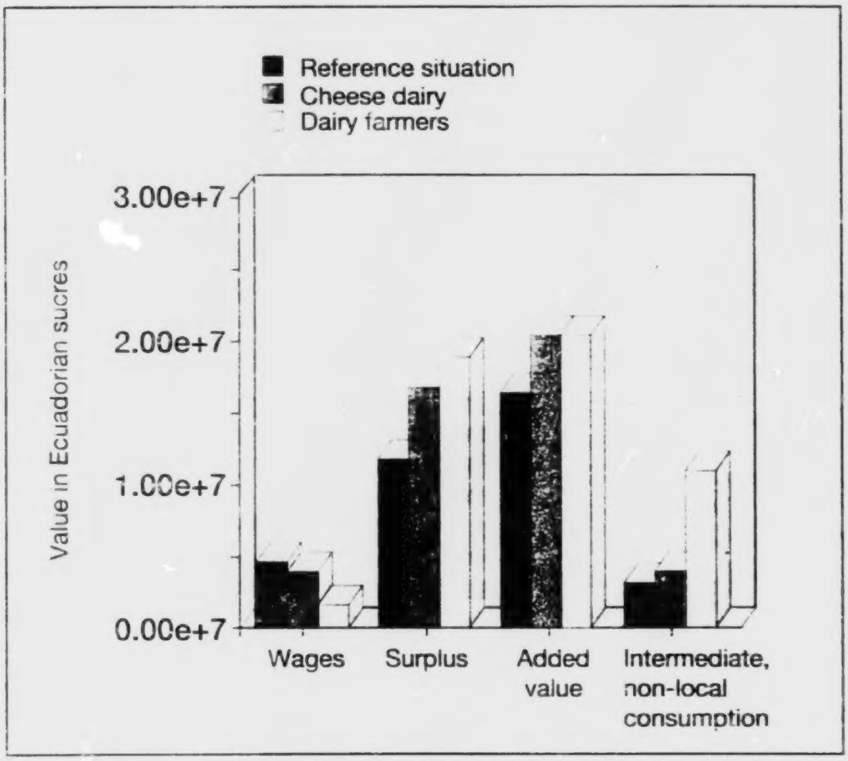

Figure 3 : Regional impact of the Salinas cheese dairy

UNORSAL, THE DYNAMICS OF ORGANIZATION

It was the cheese dairies in Bolivar province that gave impetus to the project, then, and which served to consolidate an organization in which social objectives have always prevailed over economics. From the outset, the economic aspects - that is, the productive activities - have always been viewed as a means of attaining the objectives of social development. The functioning of the cheese dairy is original : it is based on two broad principles :

- the cheese dairies are not the exclusive property of the dairy farmers, but belong to the entire community. This avoids the pitfall of having only the dairy farmers, and especially the large producers, reap all of the profits, which would widen the gap between rich and poor ;

- profits are not redistributed among members, but serve the community as a whole through savings and loans cooperatives, as well as through the development of social services such as popular medicine (free medication for families and half price for animals) as well as for the organization of social activities such as festivities and gifts for schoolchildren.

The organization process was as follows : the first phase was experimental, to see whether cheese-making could be done properly and was acceptable for the population. During the second phase, larger scale production was launched in Salinas, with a cooperative that accepted all townspeople and those from the outlying area ; this may be considered a learning phase. In the third phase, each community created its own cheese dairy within a

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decentralized system. This enabled them to be more independent and to learn to shoulder responsibility within a social and economic development process. Last, a fourth step involved the creation of a federation of cooperatives which are not all cheese dairies ; this enhanced coordination between projects, so as to limit their cost.

The population has consistently participated actively, especially through collective work projects, inherited from the "mingas" of the colonial era. The cheese dairy facilities were built and arranged through this system, which demanded a great effort on the part of inhabitants.

And yet, at the beginning of the project the engineers complained that the population took little interest in agrobusiness activity. Producers were attracted by a good price for their milk, and hoped that the Swiss engineers would stay on permanently to help them solve their problems, thus making sure that the milk processing and commercialization would be done properly. According to the same engineers, "traditional paternalism" was a limiting factor for the development of the project. "Peasants are not accustomed to taking initiatives for the advancement of development in their region. They tend to leave decision-making to the priest, the engineer or any other individual who is willing to play boss" (Dubach, J., 1979).

While this was the situation at the start of the project, things have changed considerably since then. UNORSAL, the Salinas Union of organizations, presently groups 22 organizations in the Salinas district : 2 cooperatives and 20 pre-cooperatives (cooperatives in the process of legalization). Each village or community has its own savings and loan cooperative, representing 22 cooperatives in all. In those communities where a cheese dairy exists (8 communities), the cooperative receives the profits directly. In the case of Salinas, the cooperative also receives the profits of other activities (pork-butchery, spinning mill). Those cooperatives which have no cheese dairy receive funds directly from UNORSAL in the form of credit at an interest rate of 1.5 % (see figure 4).

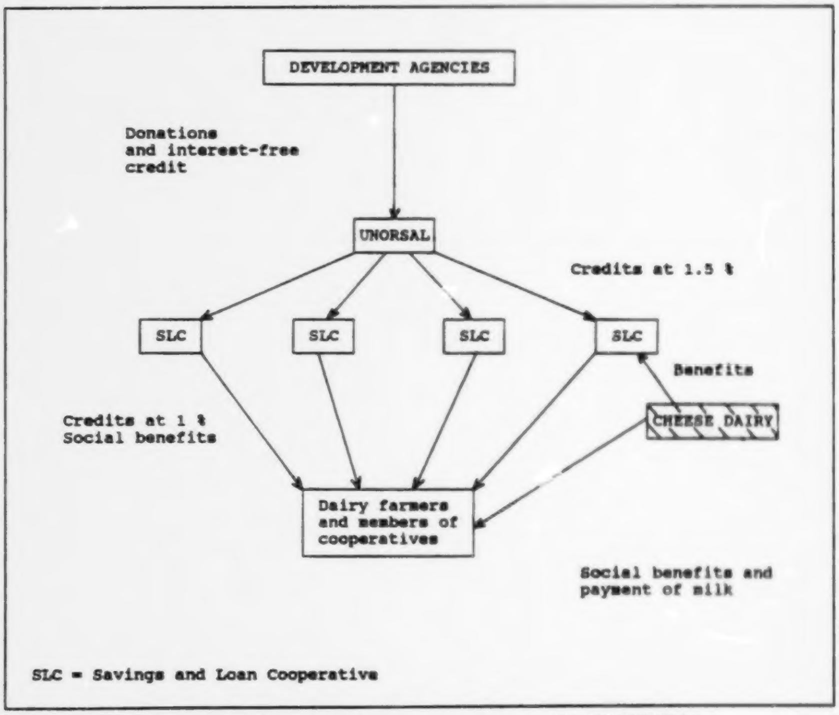
DEVELOPMENT AGENCIES
Donations and interest-free credit
UNORSAL
Credits at 1.5 %
SLC
SLC
SLC
SLC
Benefits
CHEESE DAIRY
Credits at 1 %
Social benefits
Dairy farmers and members of cooperatives
Social benefits and payment of milk
SLC = Savings and Loan Cooperative

Figure 4 : Organizations connected with UNORSAL

The relations between the cooperatives and the productive activities are such that all activities are the property of the cooperatives in the community in which they function. The Pumin cheese dairy, for instance, belongs to the Pumin savings and loan cooperative. All members of the cooperative (which include peasants who do not produce milk) have the right to vote in decisions pertaining to the cheese dairy (price of milk, investments, use of profits). Only the accountancy department and the board of directors (the manager and the secretary) are kept separate, so that the circulation of money and responsibilities for production can be kept as clear as possible.

UNORSAL functions well, despite some financial problems. It is a fact that its limited resources (all donations or loans) make it impossible to respond to all of the peasants' requests for credit. More specifically, the heads of the organization strongly resent the lack of State aid (from the ministry of agriculture, Fonderuma) and of help from the banking system (interest rates are too high and the requirements too strict for small producers). Further, of all the productive activities set up so far, the cheese dairies are the only truly profitable ones. In the case of the pork-butchery, for instance, the cost of pork is too high for the venture to be profitable. And because the equipment of the spinning mill is overly sophisticated it is often broken, so that production must stop for several months for repairs.

At present, UNORSAL and its directors manage all of the Salinas township's cheese dairies, practically independently of the ministry of agriculture's "rural cheese dairy" project. However, they do have the support and the "moral strength" of three individuals who have always been extremely influential in the project, but who no longer officially participate in it. Father Antonio Polo lives in Salinas and participates in the UNORSAL meetings. José Dubach, the Swiss engineer attached to the project lives in Quito, but returns frequently to Salinas to give technical counselling to the cheese dairies, and José Tonello, the director of FEPP (Fondo Ecuatoriano Populorum Progressio), provides essential support for the organizational aspects of UNORSAL.

Neither the directors of UNORSAL nor these three individuals suffer from this situation of relative dependency. Paradoxically, this completely informal collaboration is experienced as a free space in which the directors can deal with the problems they encounter without the interference of internal factional and interpersonal conflicts, or of conflicts of interest, and can exclusively consider the interests of the community.

MOTIVATED DEVELOPMENT

The initial project was officially mounted by the Swiss assistance agency and the ministry of agriculture. However, while these two entities did play a major role in the project, especially for the technical aspects, other organizations were also called upon for organizational and social development aspects, which turned out to be essential to the success of the project.

The Swiss assistance agency (COTESU) is quite experienced in rural cheese dairy projects, and some engineers of the likes of José Dubach have been working in Nepal and in Peru for many years. While the Nepalese project was successful, the Peruvean project experienced commercialization difficulties, and the Swiss workers were obliged to abandon the project. However, the experience acquired there incited the Swiss to transfer the project to another Andean country, and the success encountered in Ecuador corroborates their choice. COTESU provided financial support for this project, along with two Swiss engineers, for 10 and 7 years respectively (representing, in all, 770,000 Swiss francs and 177 months of work by experts). The official convention between the Swiss assistance agency and the Ecuadorian government is now at an end, but COTESU continues to back the project through the mediation of José Dubach, who helps out two months a year.

The ministry of agriculture is the Ecuadorian party to the convention signed between the Swiss and Ecuadorian governments in 1978. Actually, its participation consisted in providing the project with an engineer from the ministry who was to work in coordination with COTESU and the regional agricultural delegations in charge of providing technical assistance in dairy farming. The convention came to an end in 1988 and the responsibility for the project devolved on the ministry. The objective of the latter was and still is the extension of the project to other regions and the creation of other cheese dairies. At the time of writing, there are no functioning cheese dairies created by the ministry of agriculture.

Actually, these two organizations mostly cooperated at the technical level, providing technology and training for cheese-makers within communities. However, if the project is as far-reaching as it is at present, it is essentially through the less acknowledged but equally important work of socially oriented organizations. The first one to have worked in the Salinas area is an NGO connected with the catholic church, Operation Mato Grosso. This is a group of Italian volunteers working in Ecuador since 1968, to support the human betterment of socially marginal groups. The group that arrived in Salinas in 1971 was composed of an Italian priest, father Antonio Polo, and several volunteers, including the present director of FEPP, José Tonello. This group was the true catalyser of development in Salinas. It began its action in 1974 with the creation of a savings and loan cooperative, so as to foster the participation of the entire community. Small projects were set up, such as the building of a communal house, the renovation of homes, the introduction of drinking water and the implementation of farming and crafts projects.

In 1974 the cooperative made a first attempt at producing cheese, but with no technical aid and no market, the project fell through in 1976. When the news that the Swiss assistance agency was looking for a region in which to set up a rural cheese dairy project, father Polo did his utmost to persuade the group to come to Salinas. He always likes to tell the story of how Salinas was chosen for the project : "The feasibility studies had shown that Salinas was inappropriate ; however, FEPP learned of these logical, scientific conclusions and asked the Swiss engineer to visit Salinas. The latter was given a good reception, he was allowed to ride a fabulous horse, and he liked the people and the countryside. The project was set up in Salinas" (Padre Antonio Polo, 1990). The convention was officially signed with the government, then, but the actual collaboration in the field took place between the Swiss engineers, the priest and the promoters of FEPP.

FEPP, a non-governmental organization with ties to the catholic church of Ecuador provides social/organizational and managerial aid for the peasant organizations. From the outset of the cheese dairy project, this organization offered credit for building the plant and starting up work. Its role has essentially been organizational, however : from the start, this agrobusiness was not viewed so much as an objective in itself but as a means for achieving more socially oriented objectives such as strengthening peasant organizations, reenforcing community cohesion, helping the poorest people, fostering equalitarian development, helping people to become aware of their responsibility and increasing their chances of having a better life.

Concretely, FEPP supports 15 cheese dairies throughout the country, by providing credit, help in commercialization through shops in Quito and Guayaquil, training for leaders and peasants, moral and "political" support for UNORSAL and the cooperatives of which it is composed.

It was the combination of good technical assistance and constant support for community organization and social dynamism, then, which enabled the project to achieve a degree of success in the Salinas district. This is not the case of the other cheese dairies, set up by the same project, but for which the essential aspect represented by social organization is lacking. Having met with success in Salinas, the project leaders wished to repeat the operation and set up rural cheese dairies throughout the country. However, both the ministry and the Swiss assistance agency confined their role to the delivery of technical assistance in communities receiving support from other NGO, but the latter lacked the experience in social organization of Operation Mato Grosso and FEPP. As a result, of the 11 cheese dairies created in other regions, 4 have closed, 1 functions poorly, 3 function moderately well, 2 function well and only one is highly satisfactory.

In conclusion, there have been great changes in the region since cheese production began, in the framework of this project. However, there is not necessarily a direct link between these changes and the agrobusiness activity, since the latter was never seen as an isolated activity, except inasmuch as it was a means through which the community might achieve overall development. All of the facets - social development, organization, equalitarian distribution of profits - were equal in importance to the income generated by the cheese dairies.

The personality of the Salinas parish priest, as well as the constant presence of an organization such as FEPP, were decisive factors in the success of the project in the Salinas region. The absence of these social factors in the cheese dairies created in other regions by other organizations thus at least partially explains the difficulties encountered by some of these. For the same reasons, the creation of a federated regional organization has only been successful in Salinas, because only there was social development the cornerstone of the project.

PROMOTION OF RURAL AGROBUSINESS IN NICARAGUA*

THE GENERAL CONTEXT

PRODESSA (Centre for promotion and counseling in research, development and training for the agricultural sector) is a Nicaraguan research agency with the status of NGO, which has been working at the local, regional and national levels since 1987. At the local level, this centre provides support for peasant initiatives which help to increase peasant incomes and improve their living conditions (by diversifying farming activities, decreasing post-harvest losses, improving commercialization, etc.). At the regional level, it uses concrete experience to establish technical, economic, organizational and methodological references applicable to rural situations and susceptible of use by development agencies in other districts within the region. Last, at the national level, PRODESSA participates in the training of Nicaraguan professionals, by organizing field training for students, or work on research topics of value for peasants, etc.

The approach adopted by the PRODESSA team (composed of agronomists, an agro-economist and a sociologist, some zootechnicians and agricultural/food engineers) may be defined as action-research with active peasant participation : it has been tested since 1987 in this NGO's first place of work, the San Dionisio catchment area. This choice corresponded to several objectives : in particular, the highly diversified agro-ecological and socio-economic environment in this small region facilitated the creation of a wide range of references, and would therefore have an impact at the regional and national levels. In addition, the population (approximately 2,500 peasant families) is socially dynamic, relatively well integrated in the market economy and is open to change, all of which qualities are valuable for a development project.

In 1987, a preliminary diagnosis made in San Dionisio yielded a description of the area and an overview of the different types of production systems. PRODESSA's objectives gave priority to those involving intensive use of land. The existing farming units were comprised of one to four hectars per active worker, on plots with slopes often exceeding 30 %, and little equipment : a few tools, for the most part, and barrels for grain storage, a plow, a pair of oxen, occasionally a few pigs and cows for the richest. The main crops were maize and red beans, and in some cases, coffee plantations along with fruit trees, some tomatoes and vegetables, and a few animals.

The systems approach excluded focussing exclusively on farms as such, but included their relations with the upstream end of production (credit, inputs...) and above all with the downstream end. For each theme, the thought and action process began with an analysis of the situation leading to a diagnosis (problems to be solved, advantages and constraints), followed by a search for technical, economic and organizational alternatives, experimentation in a real-life situation when necessary, evaluation of the outcome and implementation of a programme for the popularizing of innovations.

*** By Pascale REROLLE (PRODESSA).**

A first assessment at the end of four years shows that enhanced capacity to innovate was accompanied by advances and concrete results in terms of social dynamics mostly affecting the post-harvest, processing and commercialization phases of farm production.

RURAL AGROBUSINESS

For a small region of the likes of San Dionisio, whose production is almostly entirely grown for sale, control of the post-harvest phases is decisive for the income of peasant families. In fact, the technical assistance offered by the popularizers from the ministry of agriculture or the NGO development promoters for small farmers is generally centred around production itself or its upstream aspects (credit, inputs, etc.). The interventions backed by the PRODESSA post-harvest programme since 1987 work at different points in the chain, depending on the problems detected in conjunction with the producers themselves. Here is one example.

Harvesting

The region's maize and red bean crops represent over 60 % of the local production, in terms of value. Poor harvesting conditions and unsatisfactory local practices not only cause grain losses in terms of quantity, but also a decrease in quality, resulting in lower prices paid to farmers. Red beans, for instance, are sown at the beginning of the rainy season and must often be harvested in rainy weather ; the creeping variety is more sensitive to rot, and the lack of drying techniques other than sun-drying deteriorate the beans considerably (they rot, become mouldy and germ). The introduction of shrubby varieties which stand up better during late rains, and of driers using plant residues (bean leaves, maize cobs) as fuel, for occasional use, has at least partially solved the problem.

Crop storage

One of the main problems expressed by growers as early as 1987 was the lack of effective means of on-the-farm storage for maize and beans, for home consumption and later sale. It is a fact that most small farmers had nothing but bags in which to put their crops, which were heavily deteriorated by weevils and rodents. One of the project's first acts was to provide support for the creation of local workshops for the production of metal silos with a capacity of 2, 4 and 9 hundredweights. These were made by craftsmen, then put on sale with a short-term credit programme for peasants. With these silos grain can be stored hermetically, provided it is sufficiently dry, and delivery of an effective and safe curative treatment using an insecticide is also feasible while the silo is being filled. Grain, and especially maize, which is already heavily attacked by weevils prior to harvesting, may thus be stored for several months without any major loss. Three years later, over 2,000 silos were in use, 13 workshops have been set up and silos have relatively rapidly been "spontaneously" put into circulation elsewhere.

First phase of processing

The market value of certain farm products increases notably after the first phase of processing. The husking and milling of rice generates an added value of about 25 % in comparison with paddy rice, after deduction of losses during processing. In 1989, the first obstacle to the development of rain-watered rice was in fact the lack of local equipment. A cooperative venture was created in 1990, and it manages a motor-run husker-miller which mostly processes the rice intended for sale. Rice occupies an increasingly strategic place in the growers' diversification scheme, thus providing a local solution to the deficit in this cereal grain, which ranks second as a source of calories in the Nicaraguan consumer's diet. Growers find it a valuable contribution, since rice bran and broken rice may be fed to animals, and they get a higher price for milled rice.

Commercialization

Commercialization of crops, and of grain in particular, is usually detrimental to the producer : markets are scattered, distances are great, shipping is expensive and the cost of many services is not incorporated in the sales price. Because they lack liquidities, farmers are also unable to wait until better selling conditions prevail, and are therefore obliged to sell their crops on a saturated market. Until 1990, a regulation bureau in operation on the Nicaraguan market guaranteed minimum prices, while production costs remained relatively low. Since then, rising interest rates for rural credit, the rising cost of inputs and the complete freeing of the grain market have created a more difficult context (1).

In 1991 an association of San Dionisio producers was created, on the initiative of the growers themselves, with the technical backing of PRODESSA. It buys grain from its members immediately after harvesting, and sells it later when prices are higher ; additional drying, insecticide treatment and packaging services generate further added value. Through grouped commercialization direct sale to wholesalers is made feasible, and a degree of bargaining power retained. During the first season, 250 growers delivered 3,000 hundredweight of grain in December, to be sold in mid-1992.

Processing

For some types of farm produce (such as cane sugar) complete processing is either indispensable or financially worthwhile. Quite recently, there has been an upturn in the economic context of cane sugar growing and its processing into "panela" or "atado de dulce". Small farmers with a cane plantation and a "trapiche" (2) have therefore resumed work, and others are attempting it, in view of diversification. This time, support by PRODESSA has taken the form of a diagnosis of the growing situation and of trapiches, resulting in suggestions for technical improvements and marketing alternatives for panela and other products such as honey.

These few examples illustrate the variety of sectors affected, and thus the need for experts with a very broad scope of competency, who may provide a genuinely valuable counselling service for growers. PRODESSA therefore does not work alone, but its network of relations and exchanges with other institutions enables it to offer and to adapt technical experience acquired elsewhere.

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(1) Crop prices in 1990 : about 8 US$ the hundredweight of maize, 35 US$ for beans. 1990 pre-harvest period price : about 18.30 US$ for maize and 58 US$ for beans.

(2) Trapiche : small-scale facility for making panela.

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Colombia's CIMPA (research centre for the improvement of panela), for instance, provides technical backing for the "panela" programme, and the experience of African grain banks has been most informative for the growers' grain storage and marketing association.

THE SAMULALI WORKSHOP

A description of how the Samulali workshop was created and how it developed will shed light on the PRODESSA approach, the type of intervention and the key elements in the success of this venture.

How this experiment began

The preliminary diagnosis had pointed to the fact that while minifundist coffee growers also produced fruit and vegetables, they had difficulty in commercializing them, to the point of neglecting their plantation - in the case of citrus fruit, in particular. Tomato-growing, which requires spending relatively large amounts of time at work and of money for inputs, for a widely fluctuating market and scattered demand, is an extremely undependable activity : "tomato-growing is a lottery : there is money to be earned, but you can also lose", as farmers say.

The preparatory process began in Samulali with members of a loan and service cooperative : for four months meetings were held at which the problems were clarified and analysed, and different solutions discussed. The conclusion was that in this particular context, the commercialization of fresh tomatoes at worthwhile conditions would require a relatively complex organization which the growers were not prepared to deal with. Other growers entered the group and took interest in one alternative suggested by the engineers on the team : that is, the local processing of part of the harvest, depending on opportunities and market demands. After a visit to a rural agrobusiness concern in the south of the country they were thoroughly convinced.

Those growers who were interested then set up an association and, with the help of PRODESSA, designed their project which entailed a polyvalent workshop in which tomato ketchup, marmelades, dried preserved fruit and orange vinegar could be made. The facilities were easy to build and little equipment was required to begin with : the total initial investment amounted to 4,500 US$ and about 1,200 work-days for construction. A 4-year loan by PRODESSA provided 4,000 US$, while the rest was contributed by members.

Gradual stabilization

In March 1989, the workshop opened its doors, the association signed a cooperation contract with the NGO, formalizing their relationship and setting down the details : technical and administrative assistance for management and commercialization, and credit for the working capital. The first year was devoted to experimenting (supply, processing, distribution) and also to adjustment to the rapidly changing context in the country. Indeed, the gradual opening of the national market, since 1988, was modifying the landscape (presence of better-looking imported products, new openings, etc.).

The workshop took steps to adjust, by choosing to produce luxury items (high quality, well packaged) and by concentrating its efforts on one product, tomato sauce. One decisive factor in its success was the fact that an exclusive agent took charge of supplying external inputs (recycled bottles, labels, sugar, etc.) and of selling the final product in the area and ultimately, nationally. This key person for the enterprise takes a rather high commission (8 %), but his familiarity with the marketing channels, his bargaining ability and total availability were indispensable qualities in this first phase. It would have been utopic for the growers themselves to take on those tasks. After two years of functioning, the programme has reached a degree of stability.

Evaluation

Sales have increased considerably, and for the tomato sauce part, the association was obliged to set up a raw material supply programme. It developed a network of tomato growers with a pre-harvest contract and a guaranteed price. PRODESSA also launched agronomic research on this crop, so as to solve a number of problems such as those arising from viral and fungic diseases. Furthermore, the workshop also makes tomato concentrate, so as to have a product to offer all year round.

The profits generated by the workshop are partially reinvested (in new cooking-stoves, warehouses) and the rest is divided up between the 15 members of the association. The women who work there have good mastery of the production techniques. Four women worked there daily in 1989 ; in 1991 they were 7.

"Samulali" brand now has an excellent reputation among shopkeepers (small stores and supermarkets) who actually request other products such as worcester sauce, mustard and ground coffee. The country's main chain of supermarkets wishes to sign a contract for the delivery of various products in the "no-name brand" category. Other groups of farmers producing milled rice and ground coffee have asked to be able to use this brand name, and the same distributor, so as to take advantage of the prestige of the former and the experience of the latter. Much remains to be done to ensure more even quality and regularity in production, but the bottom line is positive for the association as well as for the small, independent growers who can now sell their tomatoes at a relatively good, guaranteed price.

RURAL AGROBUSINESS AND LOCAL DEVELOPMENT

Four years of experience have tested and refined the working method, which rests on four key points in the case of rural agrobusiness. First, PRODESSA helps with decision-making, so that growers have better access to the necessary information (technical alternatives, channels and opportunities for commercialization, etc.), and it helps them learn to calculate in economic terms. Next, it considers specific constraints, so as to formulate appropriate technical advice, such as the development of a supply-sale system, for instance.

PRODESSA then helps by providing appropriate types of financing. Last, it offers technical assistance for farm production. The many local initiatives which have seen the light with its help have served as inspiring examples. The Samulali workshop experience is a reference for new processing units, and for the commercialization of panela : a silo-making workshop now operates on a commercial scale. Coffee growers are attempting to group the offer for their product on the recently liberalized market. This shows that San Dionisio peasants have continued to expand and to deepen the level of their reflection and organization : a genuine dynamic of local development has been generated.

In addition, the many exchanges with the outside world, and visits to San Dionisio, have contributed to the dissemination of this dynamic to other parts of the country. Reflexion on the role of RA and on methods for promoting and supporting it began two years ago : two seminars have been organized on this topic, in collaboration with the school of food technology of the university of Leon. An informal network has been created, with the participation of people working within different public institutions (ministries of finances, agriculture and health, Nicaraguan food programme, universities, many local and international NGO).

TRADITIONAL NON-ALCOHOLIC BEVERAGES IN DAKAR*

Experiences conducted in a slum neighbourhood of Dakar have called the community-based, equalitarian, democratic concept of development into question, given the weight of local power structures rooted in hierarchical models inherited from the old villages. This means that the objective of interventions is to accompany and to extend the activities of lineage groups, within their own specific logic, for the achievement of societal change defined by themselves as necessary to deal with the challenges encountered in their environment. This new approach has been endorsed by ENDA-GRAF (1).

The Senegalese are heavy consumers of non-alcoholic beverages. A walk through the streets of the capital provides ample evidence of this. The beverage market is characterized by two types of product : industrial soft drinks sold in 30 cl and 1 liter bottles (coca cola, fanta, seven-up...), and traditional drinks, less expensive, sold in plastic bags. The most popular are made from bissap, monkey bread (fruit of the baobab tree), ditakh, tamarind, ginger or curdled milk. They are sold around the market places, train stations, bus stops and other bustling places.

Numerous difficulties

In urban and peri-urban areas, imported beverages bottled in Senegal under foreign license provide severe competition for these traditional products. The former are attractive, since they represent industrialization, a modern lifestyle and cleanliness. They also are easier to store and ship, thus facilitating the development of a very extensive commercialization network.

The production and sale of traditional drinks, on the other hand, suffers from some major difficulties. These mainly involve their taste, conservation and packaging. The conditions prevailing during their preparation, the high outdoor temperature and inadequate refrigeration cause the juices to deteriorate rapidly. The hygiene department has launched a campaign to draw attention to this problem, so as to improve production conditions.

Furthermore, there is no real distribution network for these drinks. They are sold at "strategic" places close by, and the "personalized" sales system based mostly on social ties often restricts the clientele. Customers buy the drink because they know the salesgirl, her family or her house. This sales system is partially justified by the non-industrial nature of the production system. However, some juice-makers have succeeded in attracting a larger clientele, apparently because of their know-how and the quality of their products. But given the problems of storage and

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(1) It is in this framework that ENDA, GRAF (Research Action Training Group) and GRET (Research and Technological Exchange Group) came to collaborate. The GRET's TPA team provides backing for units in different countries, inventories traditional techniques and improvements of them, and acts as network facilitator for the processing of agricultural products. The present study combines the ENDA-GRAF method for approaching social networks and the technological contribution of GRET, to discuss the subject of traditional non-alcoholic beverages.

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commercialization, the juice-maker cannot take the risk of increasing her production if she is not sure she can sell it within one or two days.

Development possibilities

Despite these difficulties, there seems to be increased interest in traditional beverages in recent years. In spite of the competition of industrial drinks, they are still in great demand. This competition is not as intense in the outlying neighbourhoods, however, where the inhabitants, mostly country people who have fled to the cities, do not have as much purchasing power and are less influenced by the urban consumer model.

Low production costs, simple methods, possible diversification and innovation in the cottage industry sector constitute assets in the competition with the industrial sector. This is only feasible, however, if producers and sellers take steps to achieve a degree of cleanliness and to improve the looks and preservation of their products.

This conclusion points to the economic and social value of the traditional beverage sector, which generates employment for a whole category of people and supplements their income.

These drinks are mostly made by women. Juice-making techniques are the property of women and are transmitted by them. The producers may be mothers, or girls looking for an income : they work part time and thus complete the family's resources, find the money to pay the electricity bills, or attain a degree of financial independence. They usually choose this activity because they possess the type of traditional know-how on which most cottage-industry food-making is based, and do not need any specific training. If a woman does not know a receipt accurately, she can always find someone in her family or social network who can complete her knowledge.

Little equipment is needed and it is not very sophisticated (cooking utensils, a few pans), the capital invested is kept to a modicum. In addition, this activity is compatible with the rest of housekeeping, and offers relative flexibility.

Production

An overview of the production system shows that the range of products on the market is not large - no more than 3 or 4 - the technical level is low, this is an individual activity done at home, and very little capital or treasury is needed. Consequently, in ratio to the money tied up, the income generated is considerable.

Juice-makers are faced with a number of specific production difficulties such as the rising cost of ingredients (sugar, which is expensive in Senegal) and electricity (70 FCFA the kwh) (1). The raw materials are not always available, leading the offer to decline while retail prices, and to a lesser extent wholesale prices, rise. There are also seasonal fluctuations in income, mostly reflected by sales, and low financial capacities.

Marketing "strategy"

Selling places and systems vary enormously. Home delivery (bissap and monkey bread ices, special orders for ceremonies)

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(1) 1 FCFA = 0.04 US$.

touches a relatively well-to-do population sensitive to the problem of cleanliness and usually possessing a refrigerator. Sales around schools offers certain specific advantages such as the lack of taxes and customers who are not fussy about quality. To satisfy the poorer clientele, women prepare small bags. As one woman explains : "A pupil has 25 F. He wants to buy several things, a fritter, peanuts, an ice cream. What is needed is cheap products. That is why we sell our ices 5 F rather than 10 or 15 F, which is the price elsewhere." To be able to sell at such low prices and still make sufficient profits, they use very little ingredients ; for instance, they add little or no vanillin and flavouring.

The strategies employed depend on the clientele and the objective. If the idea is to obtain a regular clientele of adult customers (home delivery), the main criteria will be quality, cleanliness and good appearance. If the regular customers aimed at are children (sale at schools), the vendor will pay less attention to quality, but will offer a product that is inexpensive and as bulky as possible. If the objective is to sell large amounts, with no attempt at making a regular clientele for herself (sale on the street or on marketplaces), the quality of the product will matter less than its cleanliness and above all, finding customers. The vendor is then obliged to move around, look out for potential buyers, and incite them to make a purchase.

At this stage in the process, certain constraints appear : first, commercialization circuits are short, there are few intermediaries between production and sale, many of the women sell their own production. Moreover, the clientele is often restricted to the producer's personal social network. Indeed, all of these sales systems have one major feature in common : the proximity (geographic or relational) between the producer, the vendor and the buyer. Last, income is irregular and competition is heavy.

Consumption

Traditional drinks are heavily consumed. And yet many people, especially mothers, contend that they do not consume juice or ices on the street, and many forbid their children to do so. However, many housekeepers put 25 FCFA aside daily out of "expenses" (the woman's share of the couple's income, for minor expenses) to buy a bag of juice. Many women also give 10 to 20 F to their children so that they can buy something during recreation. Their initial assertion that "neither I nor my children buy drinks on the street" requires rectification, then.

The reasons alleged for their lack of confidence in products sold on the streets are cleanliness ("children who sell on the streets have dirty hands and clothing") and sociocultural taboos (eating or drinking on the street exposes one to the workings of evil spirits).

However, family consumption surveys show that if traditional drinks were sold in shops they would be given a good reception provided the price of the 30 cl bottle did not exceed 75 FCFA. Many people do indeed feel that the development of local products is a good thing, especially now, when the slogan "buy senegalese" is mouthed everywhere. At present, a quarter of a liter of factory-made mango juice costs 135 F, the half-liter of factory-made bissap juice costs 250 FCFA : that is, as much as a liter of coca cola.

Perspectives

Industry is now taking interest in this traditional sector, as shown by the recent creation of industrial juice-making units (SOCA, SITRAF) and the development of syrup production (FAKHRY, UNISALY) using local produce. In addition, ITA (Institute of Food Technology) has perfected receipts for the cottage-industry production of new items. There are seasonal periods of overproduction of some fruits (mangoes, oranges, ditakh), and losses are then considerable owing to saturation of the market.

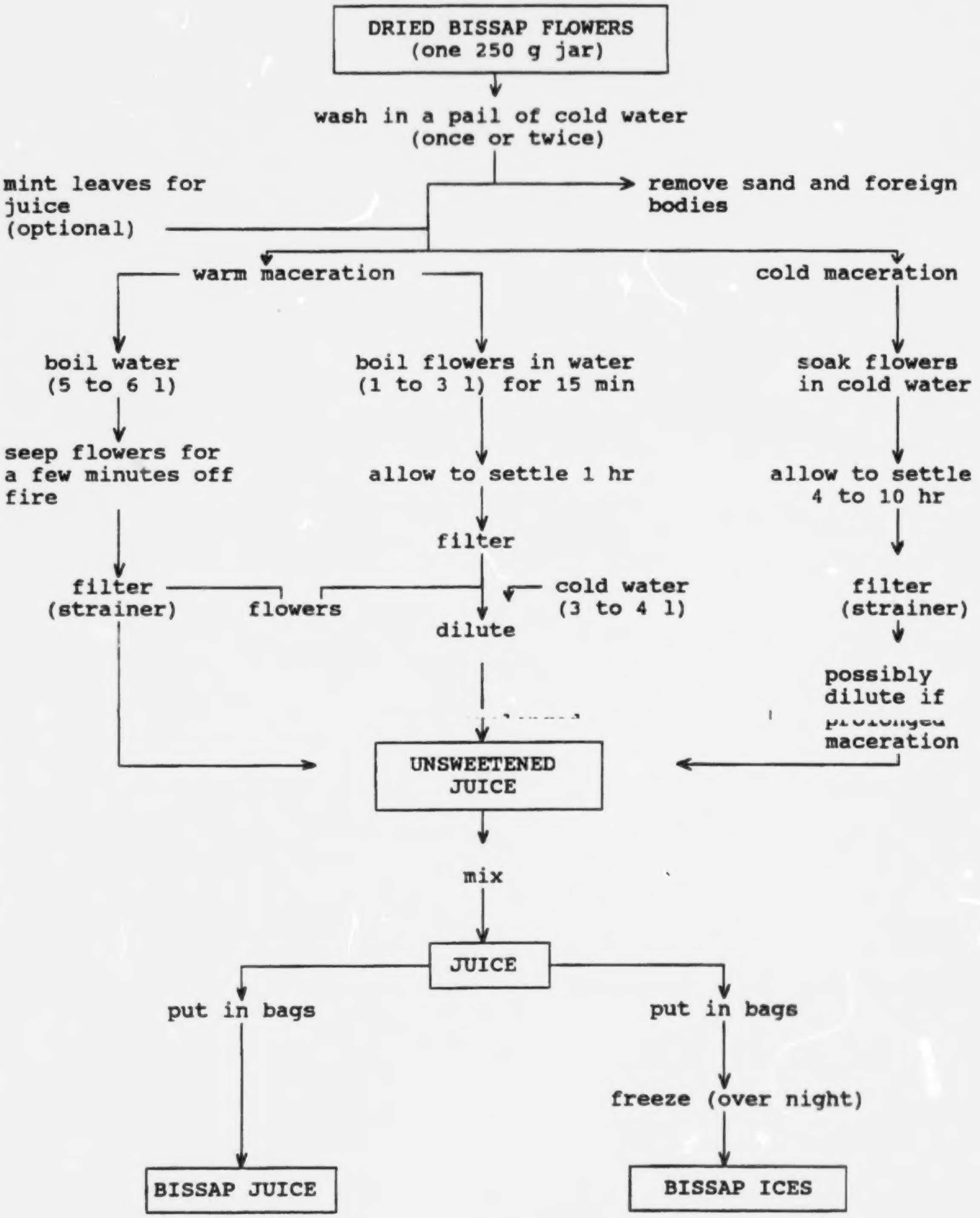
The ENDA-GRAF/GRET project includes an intervention aimed at helping interested individuals to solve the problems encountered, and more specifically to circumvent certain constraints which limit the expansion of the traditional beverage market : the limited nature of the commercialization network, the dubious cleanliness of drinks made at home and their perishability.

What place can the cottage industry traditional beverage sector stake out in the present favourable context? How can women be helped to adjust their processing techniques to the demand, and to sell products that are appropriate to the new environment?

As seen above, the study of the traditional sector pointed out the assets and constraints of the system. At that point, the objective of the intervention was to take advantage of the assets by maintaining the home-made aspect of production and the flexibility of distribution circuits. The constraints should be circumvented by proposing simple alternative technologies, so as to achieve home processing of high-quality, less perishable products. The next phase, then, consisted of inviting women to participate in trial product-making sessions. A concise assessment will be made at the end of the experimental phase. The women will adopt, modify or reject the alternatives proposed, depending on their own interests.

This article was written by Jean-Laurent BAUDET in the framework of a journalism internship.

HOW TO MAKE BISSAP JUICE AND ICES


DRIED BISSAP FLOWERS (one 250 g jar)
wash in a pail of cold water (once or twice)
mint leaves for juice (optional)
remove sand and foreign bodies
warm maceration
cold maceration
boil water (5 to 6 l)
boil flowers in water (1 to 3 l) for 15 min
soak flowers in cold water
seep flowers for a few minutes off fire
allow to settle 1 hr
allow to settle 4 to 10 hr
filter
filter (strainer)
flowers
cold water (3 to 4 l)
dilute
filter (strainer)
possibly dilute if prolonged maceration
UNSWEETENED JUICE
mix
JUICE
put in bags
put in bags
freeze (over night)
BISSAP JUICE
BISSAP ICES

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FROM RURAL AGROBUSINESS TO THE MARKETPLACE*

Agrobusiness, defined as a process integrating the different stages or phases of a system, implies that the farming, forestry and animal husbandry stages are in a direct relationship and in interaction with processing and adjustment, and definitely have ties with the users of the different products which such an agrobusiness system may develop.

As an integrated process, agrobusiness must concern itself with the satisfaction of a market. In an extremely liberal economic system, every business venture, irrespective of its nature, must clearly define its strategy so as to ensure its survival in a highly competitive environment.

PRODUCTION

Agrobusiness has consistently been characterized by the development of technologically relatively unsophisticated cottage industry productions based on tehniques that are appropriate to both environmental and economic conditions. The global approach to production involves taking advantage of some micro-regional comparative advantages and integrally exploiting forestry, farming, animal husbandry and seaside productions. The vast majority of rural agrobusiness ventures tend, to some extent, to produce too much and to overlook the importance of market surveys, which would enable them to direct their efforts toward some potentially profitable solutions.

One most important point : the consumer's demand must be satisfied. Now, the distance between agrobusinesses and the large consumer centres often makes systematic, satisfactory awareness of trends and/or consumer tastes difficult. The development of agrobusiness may succeed or fall on this point. The market must be observed and studied, and production adjusted to the desires of consumers.

There are definite "fashions" which tend to induce changes in the consumer patterns of the large metropolises, and this is where rural and peasant agrobusiness should attempt to find openings. At present for instance, there is a strong trend toward "natural products", and the large companies have already concentrated on responding to this demand, which probably could be satisfied by small processing units.

PRODUCTS AND MARKETS

To begin with, rural agrobusiness must give priority to analysing what the market needs, if it is to develop and consolidate its position. This analysis of the market is particularly important in the present-day world, where the mass medias pursue people everywhere, including in rural areas, increasingly easily and rapidly.

Five factors should be taken into consideration when setting up or reorienting production in a rural agrobusiness enterprise : quality, accessibility and variety, prices, advertising and promotion, and identification of markets.

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* By Waldo BUSTAMANTE (IICA).

Quality

There is no doubt about the importance of this factor for the success of any commercial activity, given the highly competitive market. Consumers are more and more demanding. This criteria is often neglected by rural agrobusiness, however, owing to the absence of means of effectively controlling the quality of products. In the rural cheese dairies of Bolivar, Ecuador, for instance, a well thought-out strategy for controlling the quality of cow's milk cheeses has been developed. This control begins with milk collection in the dairy, and each peasant member of the cheese dairies is aware of its importance.

Storage of milk in brass milk drums is mandatory ; it is carried by the peasants or their horses, over great distances. Each member who brings in a drum of milk is identified upon arrival. An official is in charge of collecting the milk, taking a sample to assess its quality, then accepting or refusing it in case of deterioration or contamination (water or bacteria). Before returning to their often far-off home, the peasants wash their empty containers with warm water and detergent, after which these are placed in steam heat. Sufficiently strict rules, both technological and with respect to hygiene, are respected for cheese-making as well, to provide the quality demanded by the market.

Accessibility and variety

The market requires sufficient quantities, quality and variety to satisfy demand. The size and capacity of rural agrobusiness enterprises, which are usually small and often temporary (depending on harvests) make it difficult to maintain a degree of regularity in supplying markets. A strategy must therefore be devised to respond to needs.

How can a market be reached, and which markets should one aim at satisfying? Some examples may provide concrete illustrations of how to answer the first question.

The Coopefruta cooperative in Costa Rica, an agrobusiness devoted to the processing of achiote (a plant-derived food colouring), sold in different forms, first commercialized its products by entrusting their distribution to wholesalers. The brand name, "tocori", used to make its products known on the Costa Rican market, became relatively popular. To reenforce its commercial strategy, it redirected much of its production to a condiment-distributing cooperative (ENCOOPER), which marketed the products of a number of rural agrobusinesses under a single brand name : Fruvel. Through this system it was able to cover a larger fraction of the market. The products of rural agrobusinesses were increasingly present on the Costa Rican market with a single brand name, first because larger quantities were available, and secondly, because a line of products was then offered, and more space was occupied by the cooperative at selling points.

Given the impossibility and inability of rural agrobusinesses to manage their promotion directly, it is important that they seek out ties with commercialization concerns of a cooperative or peasant association type, which have experience with marketing activities. This may help them to find new outlets on familiar markets.

The Chilean experience with commercialization of the products of rural agrobusiness and local crafts, "l'almacen campesino", is also worth mentioning in this respect. This marketing organism is run by a company grouping several organizations and rural production groups whose participants are women, and which trained a marketing specialist with the support of a non-governmental organization. The almacen campesino specializes in the sales promotion of its products, and constant contact with the market has enabled it to redirect production. Strict criteria for quality were set up, based on the demands of customers at the sales point in Santiago. To satisfy their increasingly demanding customers' request for more readily accessible products, the Ecuador cheese dairies now sell their cheeses in Quito. The different products made by rural agrobusiness units are exhibited and sold there all year round.

When rural agrobusiness produces for the market, it should consider developing a satisfactory line of products. It is a fact that production of a single item is a weakness for any business, and this problem is even more obvious and acute for rural agrobusiness.

Everywhere, in developing countries, the competition for markets is heavy and growing, and rural agrobusinesses will be increasingly vulnerable if they neglect the factors connected with environmental hazards. These may take the form of a change in consumers' tastes, the development of substitute products, possible defaulting by baseline sectors supplying inputs and raw materials (farm crops, animal husbandry, fishing, etc.) and frequent macroeconomic imbalances (unemployment, inflation, etc.).

To face these fluctuations with the best chances of success and to maintain agrobusiness in an economically healthy condition, it is important to produce a lead product which is constantly available (that is, with a rapidly rotating stock), and to back it with a line of products that accompany or reinforce its impact. These considerations will help in gaining markets, generating better use of plant capacities in terms of quantity and time, creating a positive image of the enterprise, stabilizing expenses and last, providing alternative weapons to overcome unforeseeable changes on the marketplace.

The experience of Ecuador's rural cheese dairies is a good illustration of this strategy, since the main product at first was soft, white cheese, or andean cheese, and the line was extended to other cheeses such as dambo, tilsit, mozzarella, provolone and Swiss cheese, with use of Swiss technology for the latter.

A similar strategy was adopted by the Coopefruta cooperative in Costa Rica : it began with a single main product, achiote paste, to which it subsequently added oregano, cumin, curcuma and ginger. This extended line of products gives financial stability to the unit, since the price and demand for the main product, achiote, tended to fluctuate.

The fish-processing project developed by the advisory agency for self-employed fishermen in Chile (CEDIPAC) is another example of the utility of this strategy. This agrobusiness, set up by a group of wives of fishermen, makes pressed, salted pulp out of jurel (scad) and sardines. There is a relatively specific market for this product, but the project's costs could not be covered by the initial demand. Following a financial analysis, the women chose to diversify production and to sell fresh fish (with head and tail removed), filetted fish, and read-to-fry fish croquettes.

Price

A whole series of objective and subjective aspects must be studied before setting prices, which should essentially reflect production costs. Usually this indispensable first consideration is not respected, because there are no accounting books in rural production units, or because accounting is not done properly. Financially speaking, the cost should include every single expenditure involved in the production of every rural agrobusiness product.

Next, there is the question of what profit margin to aim at, and this is not an easy question to answer. There are some useful criteria for setting the price of products to be marketed. Given the fact that costs must be covered, the consumer's "willingness" to pay for a product should be ascertained. This may be evaluated by surveys of a sample of individuals representative of the markets on which one intends to position oneself ; "pilot" groups, that is, the entire group of consumers one wishes to reach, play a major role. There is also the question of what type of products should be offered if the demands and needs of the market are to be satisfied.

The experience of Ecuador's rural cheese dairies is interesting in this respect. Since the production units are quite distant from the market - the city of Quito, for the most part - they set up a system for observing cheese prices. In Quito, an employee at the shop that sells cheeses from different production units is instructed to record the prices at which cheese is sold in the capital. Once this information is collected, a report is written and sent to the cheese dairies so that they may set prices with reference to their competitors. This system has another effect, which is to adjust the price of the milk sold by the peasants. This method is presently used by REDAR, a rural agrobusiness network in Chile which provides an information system as a service to the country's different agrobusiness units so as to provide elements for price-setting and bring these productive units closer to the realities of the marketplace.

Advertising and promotion

Every business should base its relationship with the market on what consumers know about its products. This is one of rural agrobusiness' weak points, since advertising and promotion are expensive. A product's appearance and packaging is perhaps the main sales argument, and this aspect should be studied before any product is launched on the market. This involves the designing of attractive labels and appropriate packaging, so that the product will keep well.

The CEDIPAC fish-processing project in Chile paid great attention to this factor. First the places where some of its products were sold (mainly supermarkets) were explored : then, on the basis of consumers' opinions, a label was designed with the help of a specialist. The colours and the most important messages to be transmitted were chosen during a session using group dynamics, with the participation of some consumers. The cost of these preliminary activities turned out not to be too high, and the product was then launched in accordance with prior knowledge about competitor products and their appearance. This also pointed to means of drawing consumers' attention to a series of other products resulting from sea fishing. The objective was attained, and the products are now sold in supermarkets in the Valparaiso area.

Promotion of rural agrobusiness products is difficult if the advertising factor is not controlled. The CEDIPAC project also set up an inexpensive, effective system for drawing attention to its products in supermarkets. The women workers in the project applied a promotion strategy in which they themselves, dressed in immaculately white aprons, prepared and served fried or marinated fish croquettes to supermarket customers. This created a current of sympathy, and these items were then bought with sufficient regularity.

In short, rural agrobusiness should not overlook the effects of advertising and promotion on the mechanisms by which products are accepted and attract interest, since this factor is extensively exploited by large companies. With a little creativity, significant results may be achieved.

IDENTIFICATION OF POTENTIAL MARKETS

In a world of mass production, standardization and the massification of communication and ideas, people experience a strong need to distinguish themselves, to be different : individuals as well as businesses attempt to stand out. Rural agrobusiness may play a role in this sphere, and to do so it must identify its strong points and its weaknesses. The reality of which rural agrobusiness partakes is of a different nature than that of large companies : it has a tradition of production behind it and also its size endows it with greater flexibility in adjusting to changes in markets.

Markets are ever-changing, and for this reason their evolution must be watched, so as to adjust to their needs and conciliate their interests with those of rural enterprises. There are a number of methods for studying markets and identifying the potential they offer.

Given its location, agrobusiness tends to view its priorities as being home consumption, local consumption, then regional, national, and for a few exceptions, the international market, in that order. Latin American experiences show this to be particularly wise. Progression, in business terms, must proceed step by step, and an enterprise must consolidate its successes so as to attain an optimal level of development. Successful selling is always based on efforts to minimize the existing risk factors and to defend the rural enterprise against the assaults of its competitors, by making it less vulnerable.

Captive markets

Some rural agrobusinesses in Latin America aim essentially at reaching what is known as "pilot" or "captive" markets. These include institutional markets (where governmental agencies such as school canteens, hospitals and homes for the elderly are the buyers) and informal markets (soup-kitchens, purchasing cooperatives).

This approach is very important, since it has some interesting features which contribute to the minimization of risks in production and help refine the functioning of the enterprise, so that it may ultimately tackle the formal markets on which competition is serious, if this is necessary and feasible.

The point of departure of the CEDIPAC project was a marketing survey which identified the need for inexpensive, highly nutritive products in the underprivileged urban areas where deficiencies in certain nutrients, and high-quality protein in particular, prevail.

Although the need was a real one among the poorer classes, the project did not neglect marketing. The promoters concentrated on attractive packaging and labels, to make sure the product would be purchased. Special attention was paid to the fact that despite their lack of money, consumers are still receptive to advertising, be it printed or on radio or television, which creates certain images that condition buying habits.

The creation of direct country-to-city food distribution circuits may be important for rural agrobusiness. Some interesting experiments have been conducted in Chile. The Country Mills, run by peasants who sell their wheat flour (at reasonable prices) to puchasers such as the small popular bakeries located in the poorest outskirts of Santiago, are a good example of this.

A number of other experiments have placed emphasis on their relations with the highly competitive formal markets. This is a worthwhile alternative, which should always be envisioned in the planning phase of rural agrobusiness. Knowledge of the rules governing the markets on which the enterprise intends to place its wares is a decisive factor. Agencies with experience in promotion such as non-governmental agencies and universities with specialists in the field, who may provide management counselling for rural agrobusinesses, may be useful at first. The financial effort which is required of the latter is worthwhile, so that development will be sustained, and above all viable.

Rural agrobusiness must observe the market and adjust to its demands if it is to live and prosper. If this approach is neglected, the peasant sector will then be deprived of an alternative. Rural agrobusiness is the second level of peasant agriculture, and the latter's survival depends on it.

THE DEVELOPMENT OF TECHNICAL RESOURCES*

"... Our people, the Runas, have always been here, before the men came from the sea

we already were leading the lamas' subtle grace hollowing the rock

growing maize and potatoes

writing the signs of the future in stone ..." - **Quechua poem**

Some remarks

What are the ideas behind the concept of technical resources? Of what value is this approach? What type of technological research is needed?

For years, development was viewed as a means by which the poor countries might, to some extent, close the gap separating them from the industrialized nations. This period may be called the "optimistic development" period. Technology was then called upon to play a key role in attaining these objectives, and great debates raged over "transferring technology" and "appropriate technology". Today, this notion is gradually being replaced - although not yet explicitly - by the concept of "pessimistic development". The idea is "to do something, at least" to avoid outbreaks of social discontent, relieve the pression of migrations to the industrialized countries and maintain some degree of balance. The technological debate has become rather unclear, the splits are less clearcut. People who only swore by "modern technique" now tend to favour solutions involving the "informal sector", whereas those who only swore by "appropriate technology" are dazzled by the discovery of the efficiency of western firms. It is in this framework that the present plea for the development of local technical resources should be viewed. It is a framework in which the ideas associated with development are beginning to fall apart, to some extent, and each society must use its imagination to discover how to build its own, original future and find resources for its economic and social well-being in its specific potential.

THE NOTION OF TECHNICAL RESOURCES

The notion of technical resources (derived from "surgere", to spring forth from the ground) raises several essential issues. First, there is the reproduction and/or the disappearance of those resources which may, some day, no longer "spring forth". Next, there is the question of the latency and/or the development of their potential : resources exist, how can we discover what they can do? Last, there is the diversity and/or the specificity of these resources, marked by their geographic and cultural origins.

*** By José MUCHNIK (INRA/CIRAD).**

Disappearance/reproduction of technical resources

There is an analogy between genetic resources and techniques, which are also a form of organization of living material, at another scale, but also with some subtle differences : techniques are not self-evident, nor are they innate. They require conceptualization of the relations between human beings and their environment.

Techniques organize man's relations with nature, with tools and with other human beings. Like every other organization of living matter, techniques have a form of reproduction, and they also disappear, along with various crafts and the usefulness of certain tools. There is a cultural accumulation of skills, an extremely rich technical heritage. Who, today, can say how long it took for pre-columbian amazonian society to develop techniques for detoxifying manioc? Who is familiar with the "experimental research" process which created the various soybean-based fermented foods eaten in Asia? The skills exist, but they are modified by the local constraints (ecological, social and economic) : they adjust or disappear.

This evolution is not linear, however : an "archaic" technique such as the wrapping of food in leaves may be perceived nowadays as environmentally safe and be redeveloped to replace plastics, with the recycling problems they entail. Similarly, some natural food colourings such as "achiote" (bixaorillana) are being launched on the international market, and are now competitive with artificial colourings which are penalized by severe regulations. The notion of technical resources is linked with accumulated skills, their evolution and their potential with respect to the constraints of the times.

Diversity/specificity of technical resources

The trend toward uniformization/globalization, furthered by certain commodities and techniques (condensed milk, tomato concentrate, etc.) occasionally conceals the hidden part of the iceberg, or, in other words, the great variety of techniques and food products which represent the dietary staples of different population groups. There is no getting around the fact that with a few honourable exceptions, this diversity is rarely taken into consideration by research, training and development agencies. A rapid tour of institutes of food technology in different countries would be quite revealing in this respect. This is "normal", since these agencies, including non-governmental organizations, have their own skills and know-how. They experience difficulty in adventuring onto unknown ground. How many projects have dealt with developing "fonio" (Digitaria Exilis) in Africa, or amaranth (Amaranthus sp.) in Mexico and Central America? How many studies have been done on techniques for processing the by-products of the baobab (Adansonia sp.) or of the algarrobo (Prosopis sp.)? Furthermore, if we consider a food such as the tortilla (maize cake eaten in Mexico and Central America) or millet couscous (eaten in the Sahel area), there is not one single tortilla or couscous, with a corresponding technique, but dozens of types of tortillas and couscous, with innumerable techniques : this diversity also reflects the cultural and socioeconomic specificity of each population group.

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Thus, when we speak of technical resources we are referred back to their diversity and specificity. This diversity should be viewed as valuable, as something to be enhanced.

Latency/uncovering of incorporated knowledge

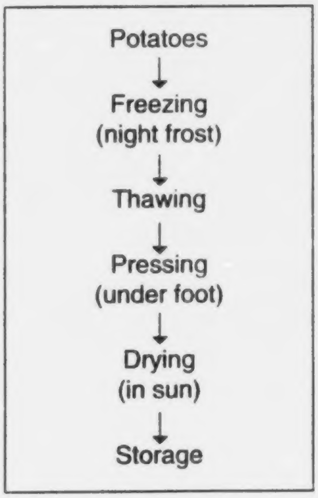
Every technique implicitly embodies some knowledge which is not simply objective (a pounder crushes millet) but which has been constructed from images and explanatory theories at various points in history. There is no doubt that if manioc is steeped in still water for several days it is detoxified ; it is also clear that this phenomenon does not receive the same explanation now as during the pre-columbian period. In this sense, the analysis of technical resources in the light of present-day interpretative instruments may be extremely interesting. For instance, sour manioc starch (starch fermented in an anaerobic atmosphere for several days) has some original features (it may be made into bread, in particular) that may be of interest. The notion of technical resources thus refers us to the uncovering of the knowledge incorporated in these techniques.

THE VALUE OF THIS APPROACH

In the field of food technology, this approach is of course valuable on many counts. We wish to emphasize three particularly interesting areas : the mobilization of local resources, the articulation between techniques and environment and the circulation of technical knowledge.

Mobilizing local resources

Andean cultures possess a series of food-processing techniques that are particularly appropriate to the local ecological situation. Preservation of potatoes by turning them into "chuño" or "moraya" is a good example. This dehydration process, based on the great variation in temperature between day and night, may be viewed as the ancester of lyophilization. The "chuño-making process" involves a series of operations during which the potatoes are exposed to frost, crushed underfoot, dried and stored, as shown in the diagram below.



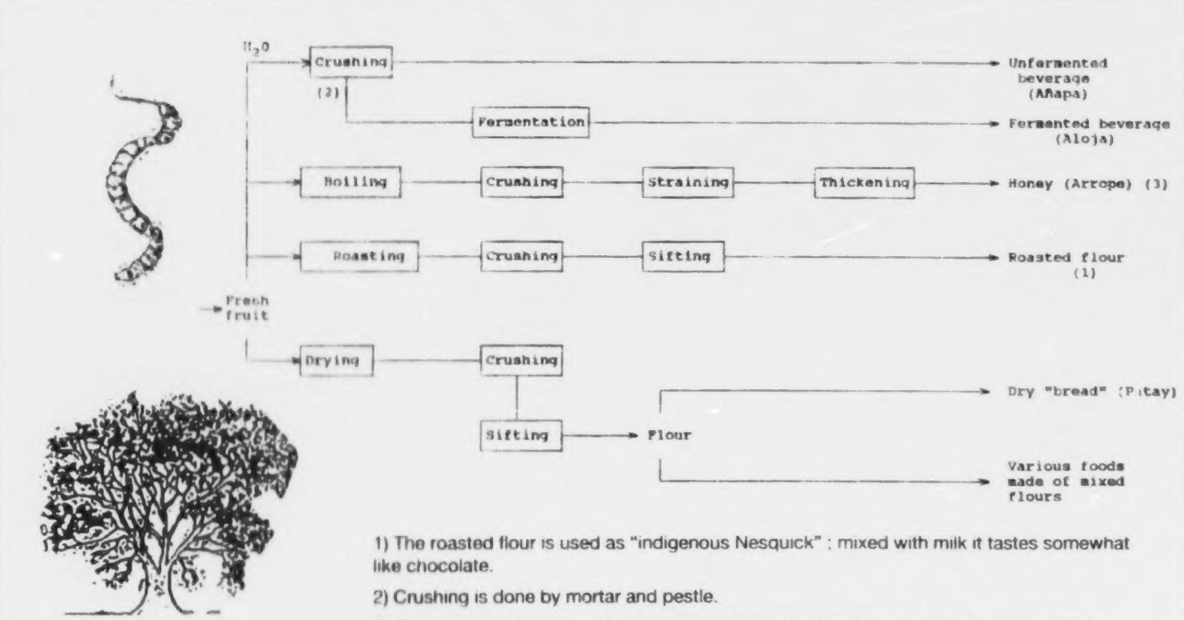
The combined action of frost and sunshine causes the cell membranes to become permeable, and the water contained in the cells is then evacuated when the potatoes are trampled under foot by the peasants. This in turn allows for faster solar drying. Where potatoes are 75 % water, "chuño" contains about 10 % water, and may be stored for lengthy periods of time. This explains why it is important as a food reserve and source of income for peasants.

"Moraya" is made much in the same way as "chuño", but it involves one added phase : once trampled under foot, the potatoes are steeped in water (Ablan, 1989).

These techniques probably remained unchanged over the centuries. Human beings as the main machine, the sun as the main source of energy have not disappeared, they are "hibernating". These techniques, well adapted to their environment and integrated in peasant production strategies, yield food products that are deeply rooted in local dietary habits : they resist. Experience shows how difficult it is to mobilize these technical resources. It is not a question of inventing an appropriate pressing machine to replace the trampling of potatoes, but one of understanding the overall organization of these resources, the influence of price-setting policies and the constraints of commercialization, as well as of enhancing the symbolic value of “chuños”, which is still considered “poor people’s food”. In other words, the mobilization of technical resources is a problem of technological policy rather than a job for engineers.

The relations between techniques and environment

Enhancing the value of products is often essential for the ecological conservation and reproduction of the environment. This is the case of certain species of trees, of which the algarrobo is a good example. Indeed, in northern Argentina, peasants use this tree to make charcoal, for lack of a better alternative ; as a result, whole forests of algarrobo are being decimated. Actually, this tree (“the tree” for the local population) may yield a great variety of food products : flour, roasted flour, drinks, sweet syrups (see figure 5). Why isn’t this know-how developed? There is no use in lecturing the peasants : profitable economic alternatives to those presently in use must be found if the management of natural resources is to be improved. It should be recalled that the example of algarrobo is only one among many : the same reasoning could be applied to many Amazonian species for which the conservation of the environment is closely tied to strategies for valorizing these species. As in the case of the Andean products, the development of economically feasible alternatives places the issue of the valorization of these resources in a framework far broader than the efficiency of a technique or the development of a new product, and requires that other technological strategies be designed, with all of the attendant institutional, legal, political and other aspects.


H_2O
Crushing
(2)
Fermentation
Boiling
Crushing
Straining
Thickening
Roasting
Crushing
Sifting
Fresh fruit
Drying
Crushing
Sifting
Flour
Unfermented beverage (Añapa)
Fermented beverage (Aloja)
Honey (Arrope) (3)
Roasted flour (1)
Dry "bread" (Patay)
Various foods made of mixed flours

1) The roasted flour is used as “indigenous Nesquick” ; mixed with milk it tastes somewhat like chocolate.

2) Crushing is done by mortar and pestle.

3) Algarrobo honey (Arrope) is also used as a medication (for sore throat, coughs, etc.).

4) INCUPO : Institute of Popular Culture.

Figure 5 : Use of the algarrobo (Prosopis Alba or Prosopis Nigra) for food in northern Argentina. Source : INCUPO (4)

Circulation of technical skills

A parallel may definitely be made between the history of the spread of cultivatable plants and the history of the techniques used to transform them. However, the two are often seen to be out of phase. This is the case of maize, which originated in mesoamerica, where appropriate techniques were developed by the pre-columbian populations, the most significant of which is "nixtamalization" : the key element in this process is the alkaline treatment of the kernel, which is soaked in a solution containing wood ash (the old technique) for several hours or, more recently, in a solution containing lime. Following this treatment, the maize is crushed into dough (masa) which has special rheological properties (it is easy to roll). It is mostly eaten in the form of tortillas, but may be used for a great variety of food preparations.

This process, which uses the whole kernel, has the added advantage of facilitating the assimilation of the lysine contained in maize (Bressani, 1958). It is therefore of definite nutritional value. Although maize is now consumed around the world, the nixtamalization process has remained restricted to the mesoamerican area (see figure 6). At the same time, maize is now

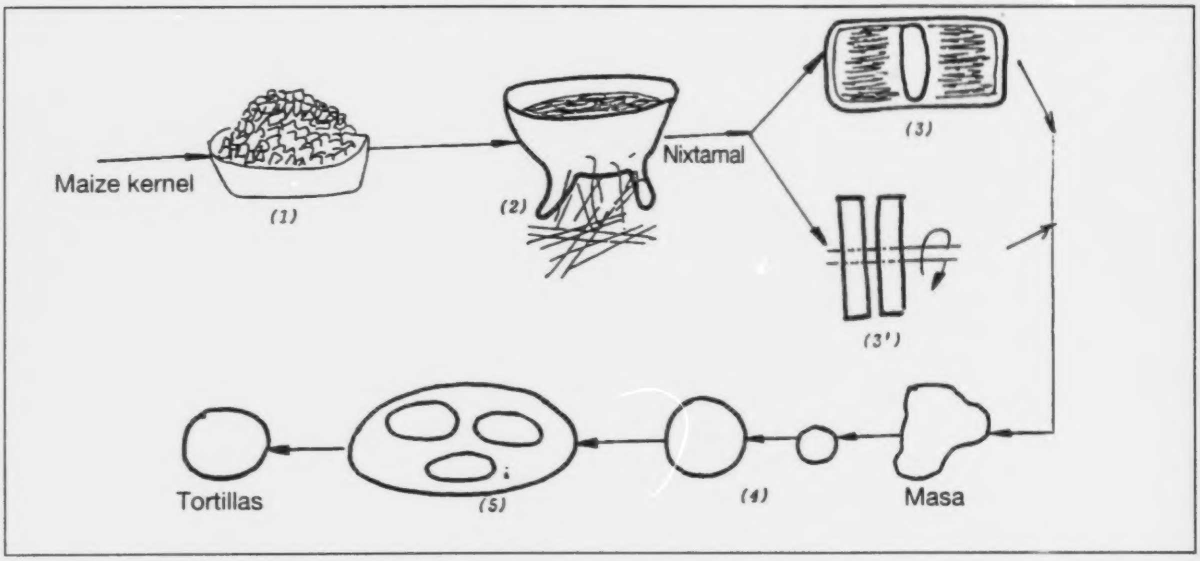


Figure 6 : Traditional technique for the "nixtamalization" of maize

(1) The kernels of maize are sorted and cleaned by hand ; the amount treated daily depends on the number of family members. In the typical family composed of a mother, a father and 4 children, about 1.5 to 2 kg of maize a day may be expected.

(2) The maize is cooked in a pot over a fire or a fuel-burning stove. It is allowed to boil for some time - at least one hour - depending on local habits. As a rule it is cooked in the late afternoon and left to settle overnight. A spoon or small jar is used to measure the amount of lime added to alkalize the maize. The volume of water added is variable, but is somewhere around one and a half times the amount of maize. The following morning, the "nixtamal" is washed and drained, after which it is crushed (3), either at home, using a "metate" (a bedstone) or at the village mill (3').

(4) This produces "masa" which is rolled into small balls, then flattened and cooked (5) in a "comal" (clay or iron skillet). The tortillas are ready to be eaten.

Note : although the traditional technique is still in use in rural areas, it has undergone some major modifications for supplying cities. Grinding is completely mechanized, as is the making of tortillas (shaping and cooking) by a network of small decentralized urban shops.

becoming a major crop for human consumption in Africa, and especially in the Sahel region. It is logical to wonder whether this technique, which could be used to prepare dishes that correspond to local eating habits, might not be introduced there. Some limited experiments have been conducted in Casamance (Senegal) for the preparation of "fatayer" (stuffed dough).

A similar argument could be applied to soybeans. In Asian countries, where they originated, century-old processing techniques are still in use, especially those based on the fermentation of the bean, for the preparation of a great variety of foods ("tempe" in Indonesia and Malaysia, "miso" in Japan). In Latin America, large-scale growing of soybeans began in 1950. They are mostly used as raw material for producing oil and cattle fodder, while people are still loath to eat them. There is of course no question of convincing Brazilians or Argentinians to eat Indonesian "tempe". The idea is not to change tastes, but to draw some inspiration from Asian soybean-processing techniques, for the development of new techniques adapted to different eating habits. This would not be a historical novelty, in fact : some African techniques for processing manioc (the making of "gari", for instance) owe much to Brazilian techniques : the portuguese colonizers were "spreaders" at the time.

Development of the nixtamalization of maize or of soybean-processing techniques as technical resources and their consideration by research and development agencies, their introduction to teaching programmes, the publication of scientific and technical information about them may all have two sorts of positive consequences : they may contribute to make these techniques more efficient in places where they are already mastered, and to spreading/adapting them to other regions for which they would unquestionably be valuable.

WHAT TYPE OF TECHNOLOGICAL RESEARCH?

Techniques have been viewed here as organizations of living material. A clear distinction was made between machines (or processes) and the techniques which give life to these machines (or processes) by linking them with well-defined human beings possessing skills and belonging to specific social structures within distinct cultural entities. This different view of techniques requires that the conception of technological research and the role of technologists be reconsidered.

Food technology, in its present form, is the product of chemical engineering, for the most part (for the understanding of processes) and of biochemistry or microbiology (for the composition and deterioration of foods). This has sometimes generated a partial view of food-processing techniques. The frequently encountered difficulties in translating laboratory findings into concretely usable forms are not unrelated to this compartmentalization of knowledge and with the lack of a "food technology" that would integrate these in a coherent whole. "Food technology" is taken here to mean the study of techniques "in situ", where they are alive, function and change. In this sense, we have counted at least four major tasks for these "new kinds" of technology.

Innovation - development of technical resources

It is important to be familiar with these technical resources, and with their natural and cultural components : what methods, what individualized operations, what factors and equipment are linked with these processes, but also, what social productive structures, what relations with the symbolic value of the products, what economic logic guides the decisions of producers? In other words, the structure, functioning and evolution of these techniques must be understood.

Diagnosis of technical resources

Technologists should view themselves as one of the actors involved in these techniques. Inasmuch as every innovation sets a series of contradictory/complementary interests in motion with respect to techniques, the role of the technologist is not only to identify "bottlenecks" and possible innovations, but the explicitation of the stakes involved in innovation, the pros and cons for the various protagonists : every technical change modifies the socioeconomic relations that have been woven around the technique. The technologist may then assess the extent to which concerted action between the various protagonists is feasible, and be instrumental in what may be defined as putting innovation together.

Technological evaluation

Evaluation is an essential task, and two types of questions must be asked :

- evaluation with reference to what? This means that the objectives of a technical innovation must be explicited, and the innovation itself evaluated with respect to intentions (creation of jobs, efficiency of a process, protection of the environment, etc.) ;

- who is evaluating? Every cooperative research/development action should be combined with a co-evaluation in which the main protagonists involved should participate.

Definition of technological policies

As shown in the various examples described, the development of technical resources touches on much more than the technique itself. The environment in which these techniques may be developed is conditioned by a series of economic, institutional and legal constraints. Technologists must take these into consideration when defining guidelines for technological policies and desirable alternatives.

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RURAL AGROBUSINESS PROJECTS : MANAGING THEIR IMPLEMENTATION*

When devising projects (defining, designing and implementing them), two opposite pitfalls must be avoided. The first is excessive formalism, in which everything is planned in advance, as in grandiose projects with books full of detailed technical specifications for their implementation. The second pitfall, pragmatism, rests on the charism of certain leaders, as a result of which the outcome of projects is tied to the power and knowledge of individuals who shoulder complete responsibility for the projects.

Our experience with RA leads us to refuse both of these models, and to prefer a managerial model based on a participatory dynamic. This position applies both to projects conducted in the framework of development operations and to operations set up spontaneously by a group, when the idea is to understand what is happening. It is unimportant to distinguish between developing and developed countries, in this respect : in both cases, the requisites - in terms of approach - for the implementation of a change-oriented project are basically the same.

These requisites fall into three categories : commercial, technical and organizational. The managerial model demands that all three be taken into account and articulated within a structured approach which is described below.

APPROACHES TO PROJECT MANAGEMENT

Let us return, for an instant, to the two models mentioned in our introduction : this reminder will be helpful in outlining the managerial approach.

The hierarchical model

The hierarchical model is behind all of the technology-transferral operations which aim at setting up a project - generally large sized, but this is not an essential feature - on a technicist basis. The logic involved here is fundamentally one in which there is a split between people who know (foreign experts) and those who receive, between those who act (engineers) and those who are acted on (the population) and postulates a black box type of functioning : local experimenting is impossible, there is no way of constructively formulating problems and solutions to them. The consequences of this type of functioning are foreseeable : most of the energy expenditure is devoted to making sure that the original power distribution is acknowledged and respected. Foreign experts want to remain experts, engineers want to continue to decide. The rest is well known : when this type of project does work, it is cut off from its surroundings and has no catalytic effect.

The pragmatic model

The pragmatic model equates the efficiency of action with the charism and "feeling" of leaders. The history of each project is suspended on the arrival of a providential leader whose resources - be they his vision, work, relations or other... - are the only means of understanding an operation and foreseeing its outcome.

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One consequence of this belief is that successful innovations cannot receive any simple explanation and above all, cannot be steered. Each concrete case has specific characteristics, and although the whies and wherefores of success or failure may be explained afterward, a forehand definition of the prerequisites for controlling the process is impossible. A successfully run project does not conform to any general rule, but depends on one "trick" or another. In this context, any element of a managerial logic is viewed as negligeable in the face of the improvisation and immediate reactions in which this pragmatic model is grounded. Is this enough? In our opinion, no, since even though change takes on a variety of forms and can therefore scarcely be assimilated to a standardized procedure, we do feel it is possible to mark out itineraries for progress which do not reject some forms of managerial know-how. The pioneering model described below illustrates this conviction.

The "caravan" model (1)

The term caravan is used here to suggest the covered wagon expeditions by which the Western USA was conquered. The "caravan" model is an attempt to illustrate a mode of functioning that is distinctly different from the previous two. What are its specific features? Collectively defined objectives, on the basis of which all of the participants agree to act (move to a given place to found a new colony) ; a set programme and a timetable for achieving the objective (travelling a given number of miles a day, for instance) ; many unknowns are encountered in the actual course of action (mishaps, conflicts between members of the group, attacks by outsiders), and continual readjustments must be made, without losing sight of the main objective. This outline helps us to define the caravan model, in that it is a finalized approach, with a temporal and spatial organization. It is self-regulated and basically rests on a participatory type of functioning, independently of the concrete forms of social interplay.

This conception views each project as a balancing-out process based on two principles. There is a gradual process characterized by the emerging of a series of balances ; this is a process in which the orientation is set not only in accordance with an external, predetermined goal, but also with the internal requirements for balance.

The question of managerial skill obviously takes a peculiar form in this context. How can its influence and control be foreseen? Perhaps - and this is our contention - it should be viewed as an approach based on ongoing diagnosis and continuous revalidation of objectives.

THE "CARAVAN" MODEL AND RA

In RA, the basic idea is to help small producers to produce more and better. This is not enough to keep them on the land, however. To attain this latter objective, they must also be helped to do away with a whole series of middle-men and to find sources of added

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(1) In the words of Mrs. ORGOZOGO. In : les paradoxes du management, Ed. Organization.

value by controlling a series of "post-harvest" operations further along the food chain (storage, processing, packaging, transportation and commercialization of products). The goals are the improvement of the dietary and nutritional situation, the strengthening of peasant organizations and a better valorization of local resources, as shown above.

Let us look at another aspect of RA, which has received little attention so far, and which might be called counting on the effectiveness of action (or of projects). This combines several ideas about the presumed outcome of the process of change. Two of these should be emphasized.

Priority should be given to action conducted within the system, so that people can maintain their bearings within their own history. By system, we mean a system of production, a social or cultural system, etc. Each of these has rules of its own, involves constraints that result from the strategies and power relationships of the various protagonists. Everyone is not equal in this game. The rules are by no means neutral, and they foster power relationships which favour some specific interests : for instance, they furnish weapons through which the most powerful people may develop their own strategy. As a result, organizations have an inherent propensity to reproduce, intact, their own constituent balance of forces. The fate of innovations therefore depends, above all, on their ability to generate and support changes in habits. What is at stake is not so much the complete reversal of future technical development, but the possibility of change organically structured within technical and organizational continuity. The possibility of genuine breaks with the past should no doubt not be excluded, but history shows that these are rare, and above all, that they generally preclude any attempt at coherent management.

An example

A project for the collective storage of maize prior to commercialization is set up in collaboration with peasant communities, whereas the maize was formerly sold immediately after harvesting. The outcome of this project will depend on the mediations established :

- technical mediations, to explain the constraints involved in collective storage in comparison with home storage ;

- social mediations, to develop a way of eliminating the "influence" of middle-men (there are time-worn interwoven personal dependencies to be considered) ;

- organizational mediations, so that peasants accept to mix their crop with those of other peasants.

The process of change must be backed by gradual learning strategies. We have stressed the need to take the social geography of actors into consideration when beginning an operation. This is a prerequisite, however, after which the entire scene is set in motion : some of the people originally interested in the project lose interest, while others join in the movement. There is no way of determining the clientele of a project in advance, since it coagulates gradually as the action advances. The stakes, as well as the actors' perception of it, are constantly modified. It is the proper management of this process that enables change to take its course. The notion of a gradual learning strategy is one possible response to this necessity.

Another example

The project for the solar drying of manioc, to be used as animal fodder, was conceived in Colombia, where it was highly successful. In its wake, an identical operation was set up in Mexico. The conditions for the valorization of dried manioc were promising at the outset : the country imported cereal grain, there were taxes favouring indigenous products and the development of industrial poultry farms promised easy outlets. It remained to convince the peasants to participate in the project. This was not easy, as is often the case, given their mentality. They had no confidence in collective action, they were weighed down by economic constraints, and land holdings were small. Success was well on the way, however, when a change in policy, with the elimination of import taxes, destroyed the competitive advantage of dried manioc. The project might have been expected to decline rapidly, for lack of a goal, but suddenly the producers rebelled against the inevitable. The action which they would formerly have viewed as impossible was no longer a utopian challenge. Their involvement in the project and their participation in collective action had changed their perception of what they could achieve : they then turned around and reoriented their project toward exporting fresh manioc to the United States.

MANAGEMENT MEANS FURTHERING DIAGNOSIS

With the caravan model, close attention must be paid to how operations are begun. If the aim is to work with the system and not against it, if responsibility for a degree of technical and organizational continuity is to be assumed, the actors of change must first familiarize themselves with their surroundings. This process is fundamental for determining the project's point of departure, and defining where it is to arrive.

There are of course some tools which help in making this diagnosis (see appendix 2), but the most important factor is the active participation of those concerned (listening phase) and the restitution of the different viewpoints (validation phase). What counts here is not the expert's viewpoint, which is what most diagnosis operations confine themselves to, but having the population speak out so as to determine the nature of the problems, the indigenous resources and the people's ability to work together. A well-conducted diagnosis should bring participants to identify the different ways in which they continue to "participate in their history" (see the article by F. Tartanac).

A managerial approach is therefore predicated on the ongoing application of this diagnostic process. Why? At the start it is impossible to picture the social geography of the parties involved. The project itself and how it unfolds may elicit interest or rejection. A constructive, dynamic viewpoint - that is, acceptance of change - is required. The motivations of participants are never simple nor self-evident, and economic stakes alone can never completely account for individual behaviour.

The argument according to which change may be elicited by offering monetary advantages is incomplete for at least three reasons :

- acceptance or refusal of a project is always rooted in motivations of several sorts (economic, rural, cultural). There are quite a few examples of innovations for symbolic reasons ;
- since there is no one true awareness of problems and solutions, there are always innumerable ways of handling an open situation, one of which is to join the project to see what will happen. Pointing up a single, definite interest, once and for all, is an extremely narrow attitude in comparison to the dynamics of any process.

The ANDES project

The main objective of the ANDES project is the improvement of food production and nutrition in village communities located in two distinct rural regions of Ecuador, representing the interandean area : 2 districts close to San José de Minas, at an altitude of over 2,200 meters, north of Quito, and 5 "recintos" near San Miguel de los Bancos, below the altitude of 2,000 meters, to the north-west of Quito.*

The grass-roots work done in each region by a health team and an agronomist began with an in-depth diagnosis of living situations : census and composition of families, characteristics of different types of production in each region (farming, large-scale cattle-raising and small, home animal-raising), history of the populations, families' economic resources (tenure of land, manpower), anthropological approach, dietary behaviour, family consumption survey and intrafamilial distribution, diagnosis of health and nutritional status.

During village meetings and the periods when the agronomists and doctors participated in the "mingas" (work done for the community), the peasants spoke in detail about their problems, and requested technical support for controlling certain diseases in maize, beans, fava beans and carrots, the introduction of some new crops (avocadoes, lemons, fruit trees), experimenting with better seed (development of hotbeds, etc.), improved monitoring of health, credit, roads and water supply for the villages. An analysis of food processing (cottage industry techniques for food reservation) and of the marketing system in each region was also begun.

Over and above the actual achievements, this approach is essentially characterized by the extent of the diagnostic work and the way in which it was accomplished. These may be defined by a few key words :

- *multidisciplinarity : doctors, agronomists and sociologists worked together on the programme, using a shared method of intervention ;*
- *participatory approach : its basic objective is self-government of action by the population, with diagnosis centred around receptiveness to the real problems of families ;*

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* *ANDES : Food, Nutrition and Development in Ecuador.*

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- research/action : in the observation situation that is specific to diagnosis, the relationship between outside contributors and the community is one of exchange (sharing of knowledge) : there is reciprocation in expressing, developing and structuring knowledge ; this gives the people themselves the opportunity to guide change.

Furthermore, the concern with "diagnosis" should not be a momentary one, present only at the start of the project, but one which is constantly present as a way of sensitive awareness of trends and changes. The goal should not be the writing of numerous reports, but the establishment of a responsive situation through programmes adjusted to the demands of families. Only through day-to-day attention to the specific dynamics of these demands can the ability to offer appropriate responses be developed. In the ANDES programme, this role fell essentially on the agronomists present in the field.

MANAGEMENT MEANS HELP IN STEERING

This is where the caravan model becomes genuinely meaningful. First, it requires that the technical aspects not be dissociated from the commercial aspects. There can be no question of producing and finding out afterward whether there is a market for the product : both aspects must be analysed from the outset. Perhaps attention will tend to concentrate on one area or the other in the course of the project, but this can only be momentary : basically, markets and techniques are like the two blades of a pair of scissors, and should constantly interact. A concern with form goes along with this approach. The caravan model was described above as a balancing process governed by two principles : it is a gradual process marked by the emerging of a series of balances, and it is a process that is guided, but whose assigned orientation does not simply correspond to a goal set previously, a priori, but is also self-regulating. How can all of these requirements be taken into consideration in the approach itself?

First, steering a project means making the logic of the organization in which they participate clear to its actors, by indicating why different people may benefit from working together and cooperating in various ways. Individual resistance to change is legitimate, and the only solution capable of overcoming it is to seek out the participation of concerned individuals in the decisions affecting them. Now, the negotiations and participation that are set in motion on this basis are meaningless unless the protagonists are aware that they may affect the course of events, even in some small way. This implies that the organization of a project should be designed as the means and the outcome of its very unfolding. In the hierarchical model, the "constructions" are imposed on actors, and their rationality is invoked to preclude any negotiation. In the present model, they are viewed as also being susceptible of exchanges, negotiations, rectifications and new recombinations with respect to time, space and form. Management of the project is knit together through the interplay of actors and the requirements inherent in the action ; this is a process whose form, place and stakes are modulated by its internal dynamics, to the exclusion of any externally imposed logic.

The second idea symbolized by the caravan model conceptualizes the project as a gradual, guided process. The fact that it is based on balance means that a series of local adjustments occur as the concrete outcome of the participation of different actors, as well as of the concatenation of a series of approximations and arbitrations against a backdrop of distinctly different, equally legitimate rationales. A project necessarily proceeds as an ongoing process through which decisions and stakes are negotiated : every effort must be made for it to take place openly and fairly, and for the acknowledgement of the equal value of the different interests, so that conflicts and struggles may be "more rational", "less restrained" and more conducive to concrete solutions.

The third idea involves emphasis on how welcome and important assistance and aid in steering by an outside professional are. A project definitely may be conceived and develop spontaneously, as attested by many examples, but outside help is occasionally necessary to unlock apparently blocked situations. The outside person should then make sure he/she does not take the place of local officials. A true pioneer leader is one who accepts not to rule over the others : he/she is there as a mediator, or to get the community out of a predicament, but never to decide in its stead. This may seem to be common sense, but it is often difficult to put into practice.

Controlling sales circuits

In the collective maize storage project, the project of a silo was conceived following a diagnosis of the state of affairs, and it was accepted by the communities involved after prolonged discussion. This storage would then make it possible to recover considerable commercial added value, since prices are frequently multiplied by as much as 2.5 three months after the harvest. At this point, the implementation and transferral phase should normally have been started, but in fact things were not that simple. Despite their prior assent, the families were reluctant to pay their share of the purchasing price of equipment. A new community president, who clearly was not overly enthusiastic about the project, came into office. The demand for aid from the government, so as to reduce the amount paid by families was not made in time, because of the change in president. In other words, the project was stopped short. How should the steering team react? It was very tempting to act in the stead of the community, or to cover certain expenses so as to get things on the move again. These solutions are not satisfactory, however. The population must be left to solve its own problems. It is up to the people themselves to reassert their initial choice, just as it is up to them to find ways to make their option a reality. Helping with steering simply means making it clear that the implementation of any project requires concrete action and decision-making, and that time imposes constraints of its own. Collective action is forged as it moves along pathways on which the true problems arise and are solved.

In the last analysis, giving help in steering means making sure that the difficulties inherent in any project are not conjured away, and that the solutions adopted are really those of the people involved.

MANAGEMENT MEANS HELPING TO EVALUATE

Every project aims at efficacy, but there are several ways of measuring it, and several questions will illustrate this multiplicity of viewpoints. Does the project yield sufficient profits, and how does it do so? What are the risks involved (the criterion here is financial profit)?

Does the project have its place in economic development (the criterion here is economic efficacy)? Are financial gain and economic efficacy compatible with a number of basic principles such as self-centred development or the satisfaction of essential needs (the criterion here is efficiency)?

In this context, it is our belief that evaluation can only be done by articulating three distinct facets of analysis : financial analysis, economic analysis and quantitative and qualitative analysis.

Financial analysis

Through this facet, the project's ability to accrue sufficient benefits for the reimbursement of loans, the replacement of equipment and the financing of whatever accumulation is desirable is analysed.

Financial gain should be applied to agrobusiness projects as a necessary condition but not a sufficient one (as incitement). Case studies show that projects are profitable for a number of reasons, the most decisive of which are :

- the ratio of added value, which may be attained in several ways. A raw product may be transformed into an elaborate one (milk/cheese), large amounts of an inexpensive finished product may be sold (dried herbs), or a new or substitute product may be offered (dried manioc chips or roucou) ;
- commercialization (see the article by W. Bustamante) ;
- the technology used in relation to the feasible scale of production, the staggering of investments and the possible use of indigenous raw materials.

Economic analysis

This facet measures the amount of added value created and how it is distributed. Economic efficacy accounts for the impact of the project on the economic development of the area involved. This impact does of course depend on the financial success of the enterprise, but also on the way in which its benefits are distributed. Several solutions are possible :

- monetary revenues for project members. The impact here is individual, and the results depend on whether the funds are used in a satisfactory manner ;
- social benefits (insurance, scholarships, projects for community improvement, etc.). The Ecuadorian cheese dairy members have personal insurance coverage ;
- participation in the community's socioeconomic development : some of the benefits are used to finance other new activities which in turn generate wealth. In Salinas, in the Ecuadorean Andes, some ten small enterprises were set up over a 5-year period thanks to the cheese dairy (see article by F. Tartanac).

Quantitative and qualitative analysis

These facets complete the above-mentioned approaches : quantitative and qualitative indicators susceptible of determining whether the project is compatible with its surrounding environment (compatibility between objectives and means) are devised. The evaluation grid is not determined in advance, but is developed in accordance with the specific contours of the project, a [illegible] self-evaluation approach. The indirect effects of community activities (loan system, purchasing collectives...) may thus be taken into account, along with induced actions for improving living conditions (roads, water, electricity, communications, etc.).

The three above-mentioned levels are not independent of each other, since the measured effects are often complementary and inseparable, but their interrelations must be specified in each individual case :

- the link between financial gain/economic efficacy is obvious, since a production project only becomes truly profitable when its upstream and downstream components are controlled. Conversely, however, economic efficacy is feasible with very little financial gain, in the monetary sense (indirect effects override the direct effects) ;

- financial gain is linked to social efficiency, but in certain situations these objectives may be conflicting.

Manioc chips

The CIAT (International Centre for Tropical Agriculture, University of Cali) already had a long history of tehcnical and economic research on manioc in 1980, when the Colombian government, represented by the Integrated Rural Development programmes (DRI), launched a project for the valorization of manioc in the Atlantic coast region. Its objective was to demonstrate the technical and economic feasibility of solar drying of manioc for use as animal fodder. It signed an agreement with the CIAT, entrusting this organization with the implementation of the pilot phase of the project. At the same time, the project received financial support from the Canadian Development Agency (ACDI) and could then enter an active phase.

Following positive feasibility and marketing studies, the cooperative DRI/CIAT project built its first pilot factory in Betulia (district of Sucre). It functions since 1981, with the collaboration of the region's manioc-growers, organized in an association, APROBE (Betulia grower's association), who both supply the raw material and run the unit. The technology is simple and was rapidly mastered by the peasants : the manioc is automatically cut into chips and solar dried on large cemented drying areas (300 m^2). The manioc-cutting machine was built locally.

The factory was run experimentally for one year, then, in January 1982, it began a semi-commercial career through a contract with a cattle-fodder business in Cartagena, which pledged to buy the entire chip production at a price set in advance. In 1982, then, 101 tons of fresh manioc were transformed into 38 tons of dried chips, over a working period of 65 days. On the strength of the good results obtained in this unit, the project launched a broad campaign for providing information and spreading this technique, which resulted in the construction of six new drying units at the end of 1983. The evaluation procedure covered one such unit. The *reference period was the 1984/85 harvest (December to June) and the sums quoted are expressed in Colombian pesos.*

Financial analysis

Results :	*ratio of added value (over sales) :*	*18 %*
	Mark-up ratio (gross trading surplus over added value) :	*70 %*
	Self-financing ability (over sales) :	*12 %*

Remarks : a sensitive, in-depth analysis shows that the project's results depend essentially on three factors. First, the price paid for fresh manioc. In comparison with the above figures, a 7.5 % price rise would generate a reduction of about 20 % on the bottom line. Next, there is the selling price of the chips : a 6.5 % drop in selling price would result in a drop of about 25 % on the bottom line. And last, the rate of utilization of the equipment should be included : a rate of utilization of less than 80 % would obviate the possibility of making a profit.

These three factors corroborate the extent of projects' dependency on their upstream and downstream environment, and the importance, for organizational purposes, of suitable adjustment to it.

Economic analysis

This is the measurement, in terms of income, of the additional effects produced by the drying project (local viewpoint) in comparison with a reference situation (exclusive sale on the fresh manioc market).

Additional effects tied to the project
included effects - local viewpoint

Entries	Amount in pesos
Earning	+ 449,892
Gross income	+ 1,667,279
Added value	+ 2,117,171
Intermediate local consumption	——
Intermediate non-local consumption and transfers	- 139,390

Remarks : the rise in gross income for the peasants, induced by the implementation of the project, is 40 %. A 52 % increase in income is seen with respect to the local added value. If we consider that the peasants themselves work on the project, they derive all of the benefits of this rise in income. This draws two remarks, however. The large rise in peasants' income (in terms of percentage) should not delude us. The effect induced by the project is particularly marked since the reference situation was very poor, in terms of distributed income. This is another feature of rural development projects : they generate a definite relative improvement of the situation of beneficiaries, when properly controlled, but this does not mean that the earnings involved are considerable.

Inasmuch as the added value remains low in these projects, performance depends on the evolution of the price of farm products. In this context, the scissor mechanism is fully active : the economic value of the project depends less on its internal characteristics than on the current trend in the market environment. It is certainly most important that the conditions under which production activities function be controlled, but their very nature makes them uncontrollably dependent on this environment.

APPENDIX 1

PROJECT ANALYSIS : SOCIOECONOMIC GRID

1) Project's contribution to development

- Quantitative indicators :

- income generated and distribution in terms of beneficiary groups ;
- number of people involved ;
- creation of jobs ;
- compatibility of the project, time-wise, with other activities.

- Qualitative indicators :

- analysis of activities induced by the project (supply/sales, services) ;
- social consequences (creation of a dynamic ; impact on the social structures) ;
- coherence means/objectives ;
- improvement of living conditions in the village.

2) Self-centred nature of development :

- use of indigenous resources ;
- appropriate character of techniques used ;
- control of the project organization (initiative, management, outside contacts) ;
- control of unfolding of the project ;
- contributions by the population (work, money, in kind...) ;
- evolution of the village's dependency/independence relationships (economic, technical, financial, political spheres).

3) Reproducibility of the project :

- on the economic plane : evolution of results and possibility of an accumulation process ;
- on the technical plane (control and improvement of technical processes) ;
- on the social plane (conflict management ; organizational autonomy).

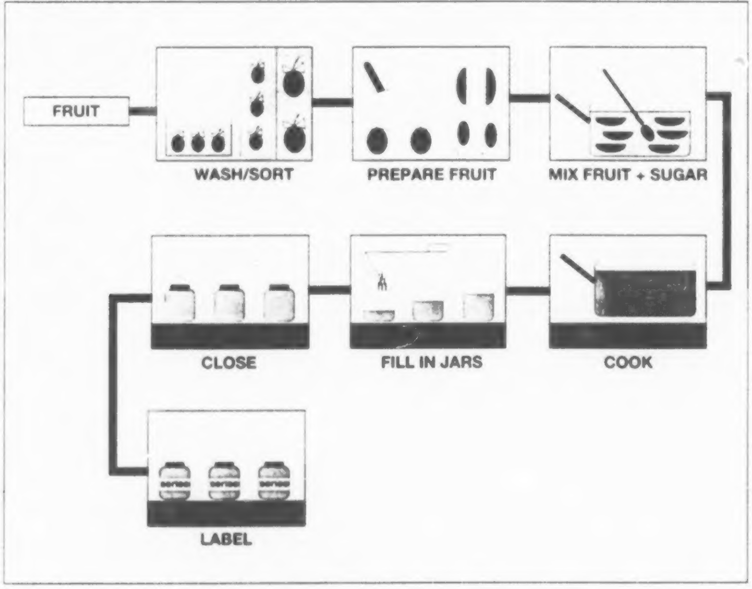
4) Analysis of social effects. Study of impact on :

- organizational ability (capacity for initiative, mobilization, emerging of a leader...) ;
- work conditions (within the project and in its surroundings) ;
- communication-coordination-consultation aspects (project level, village level) ;
- training aspects (beneficiaries of training, type of training received, contribution of trained individuals to development) ;
- management of time (project level, other activities) ;
- longer-term developmental aspects (planning of action in terms of objectives and means) ; promotion of other projects.

APPENDIX 2

MARMELADE : COTTAGE INDUSTRY PRODUCTION

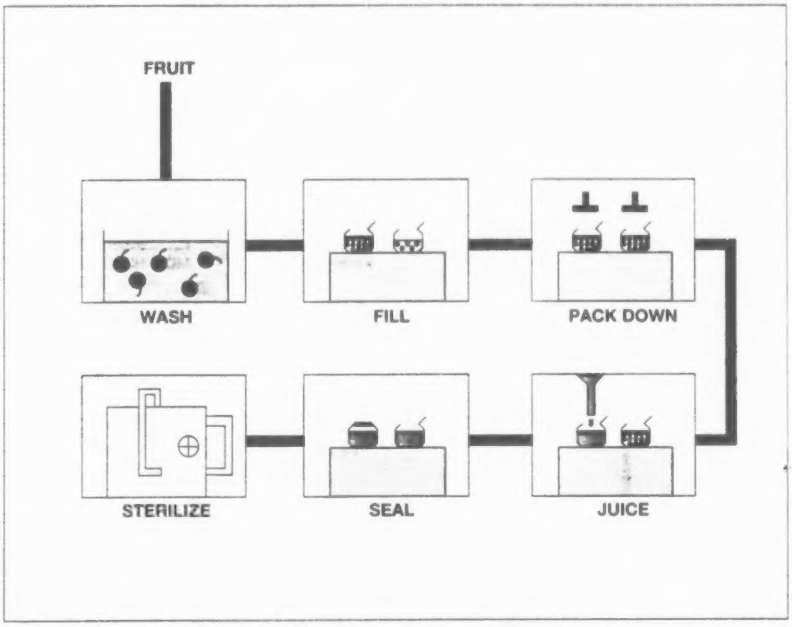
Operation	Time	Description	Points checked
Wash and sort	A few seconds	Manual	Looks, calibration
Preparation of fruit (cutting, pitting)	50 kg/hr	Scarcely ripe fruit, manual or semi-automated	
Mix fruit and sugar	About 20 min.	Manual, in a large pot	
Cook with some blanched kernels	At least 2 hours for 20 kg	Cooking time is actually determined by experience	Concentration of sugar 60-65 %, sufficient pectin, minimal acidity for jelling
Fill jars	About 50 kg/hr	In sterilized glass jars filled to the brim + capsule or cellophane	
Close	About 50 kg/hr	Manual	
Label	A few seconds	Manual or semi-automated	


FRUIT
WASH/SORT
PREPARE FRUIT
MIX FRUIT + SUGAR
CLOSE
FILL IN JARS
COOK
LABEL

APPENDIX 3

FRUIT IN SYRUP : COTTAGE INDUSTRY CHERRY PRODUCTION

Operation	Time	Description	Points checked
Wash		Wash cherries in water	Appearance of fruit
Fill	10 to 15 jars per minute	Manual, in glass jars	
Pack down	A few seconds	Manual	
Juicing	A few seconds	Automated : syrup added (water + sugar + colouring)	
Seal	A few seconds		
Sterilization	About 45 min.	In an autoclave : in batches 85°C at the centre of the tin	Appearance Temperature
Storage			Appearance



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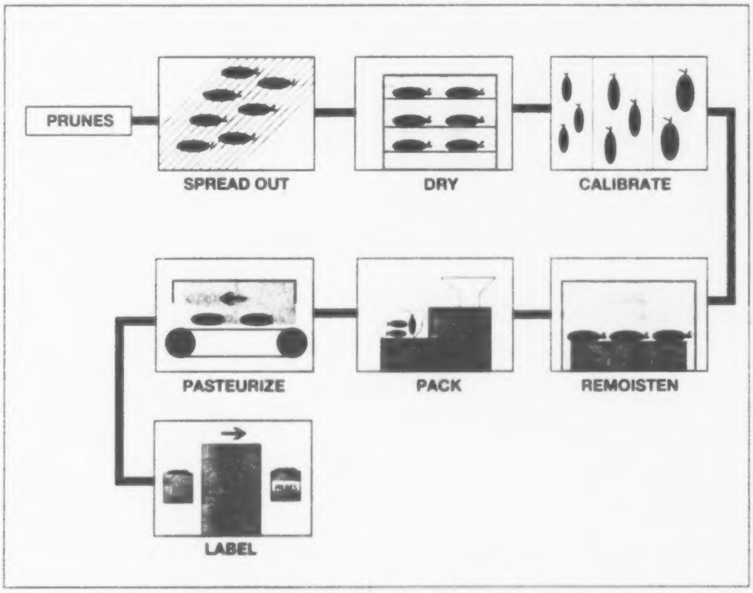
APPENDIX 4

DRIED FRUIT : COTTAGE INDUSTRY PRUNE PRODUCTION

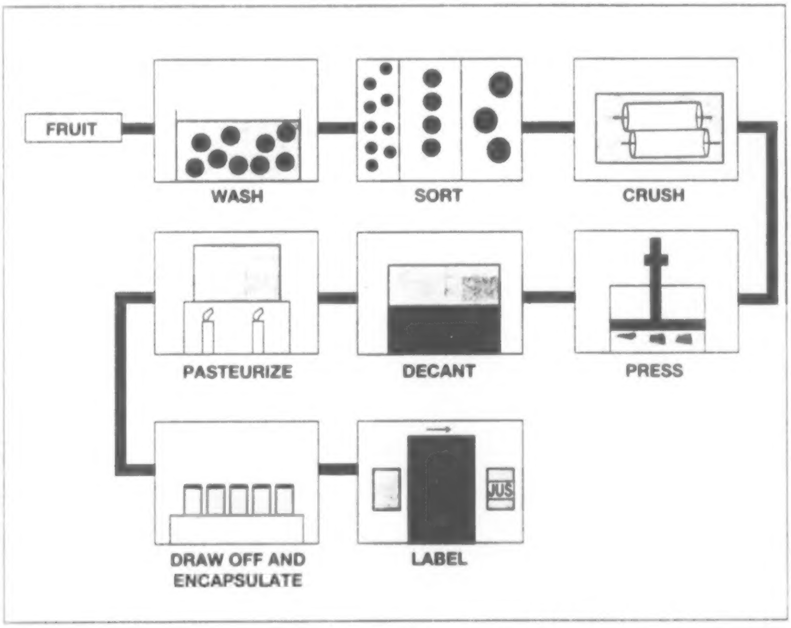
Operation	Time	Description	Points checked
Spread on fruit tray	A few seconds	Manual	Size of prune (norms), quality
Dry	18 h	Drying tunnel Temp. < 74°C. Ventilation : 3 to 7 m. s^{-1}	
Calibrate	A few seconds	Sorting of prunes by size	
Remoisten	30 min. to 1 1/2 hr	Very slight, by contact with moister air	
Pack			Weight, microbiology
Pasteurize			Microbiology Quality of packing
Label			


PRUNES
SPREAD OUT
DRY
CALIBRATE
PASTEURIZE
PACK
REMOISTEN
LABEL

APPENDIX 5

FRUIT JUICE : COTTAGE INDUSTRY PRODUCTION

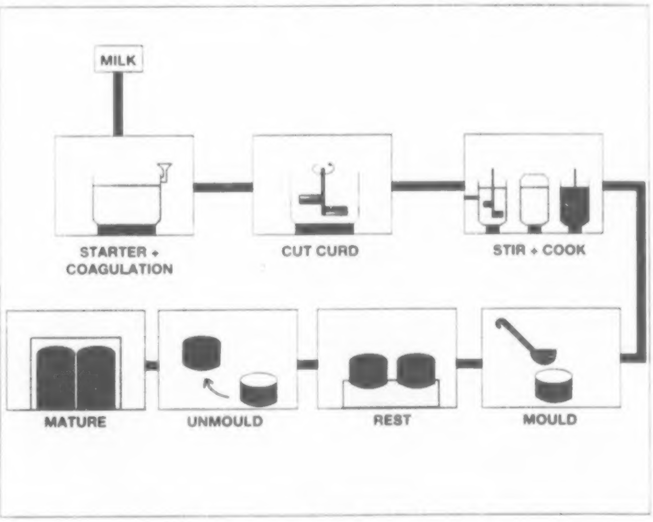
	Operation	Time	Description	Points checked
Extraction 1/2 day	Wash and sort, manually		Elimination of foreign bodies, elimination of over- or under-ripe fruit	Appearance of fruit
	Mash or crush	5 min./50 kg	Crushing machine	
	Press	10 min./50 kg	Vertical screw press	
	Decant	4 hours to one night	10-15°C in a vat or cask	Check settling, organoleptic qualities
Stabilization and packing 1/2 day	Pasteurize	50 l/h ◄──► 600 to 700 l/h ◄──►	Drums Continuous, Bauman pasteurizer (75-80°C)	Proportion of sugar (refractometry + tables). pH of juice (aim at <4)
	Draw off + encapsulate	50 l/h	Manual	
	Label		Manual ; later	


FRUIT
WASH
SORT
CRUSH
PASTEURIZE
DECANT
PRESS
DRAW OFF AND ENCAPSULATE
LABEL
JUS

APPENDIX 6

HARD CHEESE : COTTAGE INDUSTRY-PRODUCED SWISS CHEESE (comté)

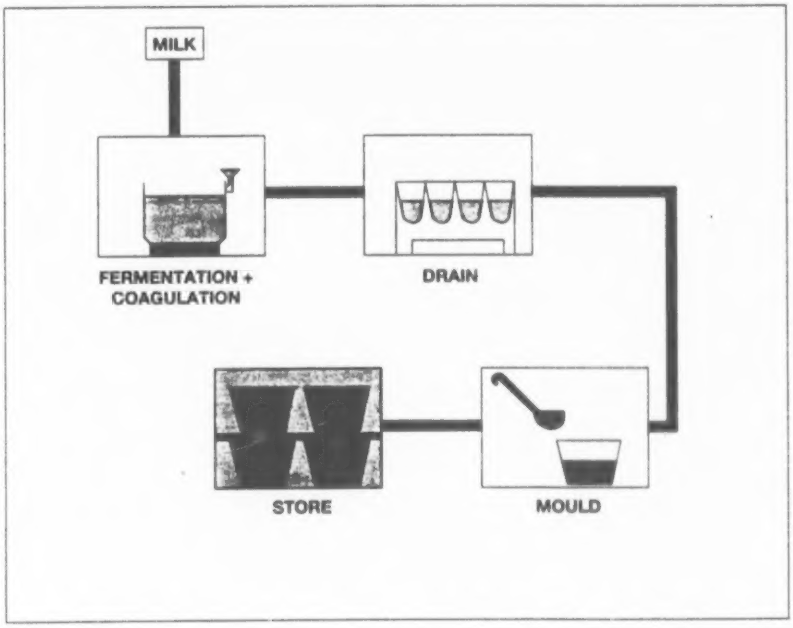
Operation	Time	Description	Points checked
Storage of milk possible	3 days at most	Coldo	
Add starter	20 to 40 min.	31 to 34°C, 6.55 < pH < 6.65, maceration of rennet stomach	
Cut	2 to 4 min.	In vat	
Stir	2 to 10 min.		
Heat	52 - 55 min.	52 - 55°C	
Stir	10 to 60 min.	Mechanical or manual extraction of curd	
Mould		pH = 5.3 Press cheese and turn it over	
Unmould	20 - 24 hr	Cool and turn 12°C	
Maturing process	1 to 3 wk → + 1 to 2 months →	Cellar, 10-13°C Warm cellar, 20-23°C	


MILK
STARTER + COAGULATION
CUT CURD
STIR + COOK
MOULD
REST
UNMOULD
MATURE

APPENDIX 7

SOFT, WHITE CHEESE : COTTAGE INDUSTRY PRODUCTION

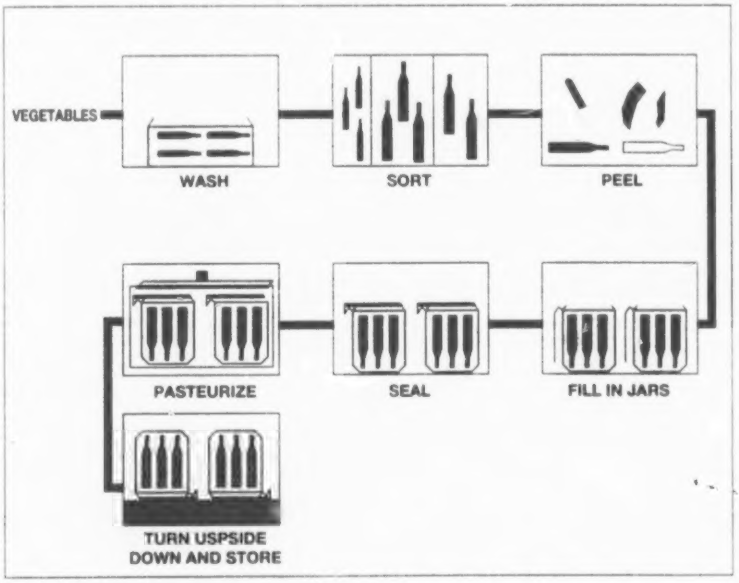
Operation	Time	Description	Points checked
Fermentation + coagulation	15 - 20 hr	Seed with starter and rennet. Manual	
Drain		Elimination of whey using cloth	Appearance
Mould	20 min.	Ladle, making several layers	
Store		In cold cellar (+ 4°C), for short time	


MILK
FERMENTATION + COAGULATION
DRAIN
STORE
MOULD

APPENDIX 8

CANNED VEGETABLES : COTTAGE INDUSTRY PRODUCTION

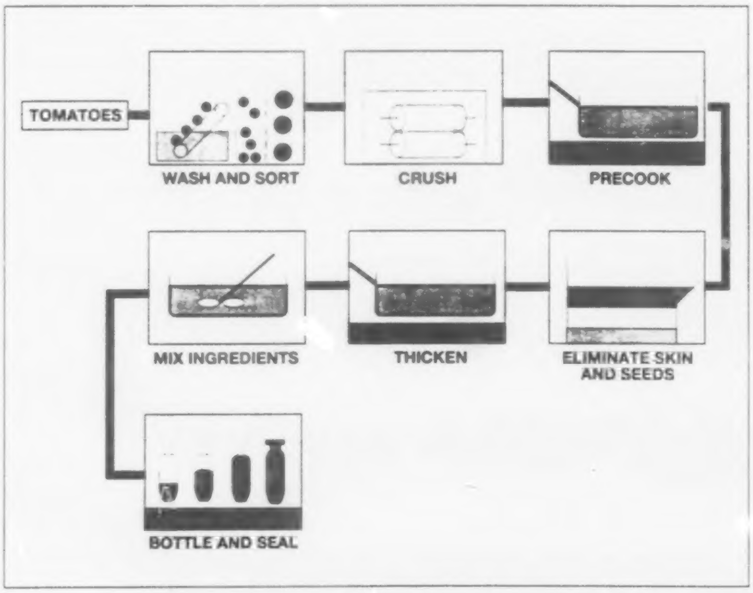
Operation	Time	Description	Points checked
Wash		In large tubs, manual	Foreign bodies
Sort	50 kg / hr	Manual	Appearance
Peel, destem	50 kg / hr	Manual except accurate calibration such as potatoes	
Fill in jars	100 kg / hr	Fill jars with vegetables, cover with water	
Close	1 to 2 min. / jar	Rubber ring for sealing	
Pasteurization	80-90°C 3/4 hr (100°C 1/2 hr)	Time is defined by tables. Large pots	Amount of water in pot
Jars turned upside down and stored			Evolution of vegetables during storage


VEGETABLES
WASH
SORT
PEEL
FILL IN JARS
SEAL
PASTEURIZE
TURN USPSIDE DOWN AND STORE

APPENDIX 9

TOMATO SAUCE : COTTAGE INDUSTRY PRODUCTION

Operation	Time	Description	Points checked
Wash		Manual, by emersion in large pans	Foreign bodies
Sort		Manual, to select optimally mature tomatoes	Maturity
Crush	5 min./50 kg	Makes a puree	
Precook	Moderate heat for 1/4 to 1/2 hr	Large pots	
Eliminate skin and seeds	A few minutes	Put through strainers	
Thicken	Cook for several hours	Large pots	Progress of thickening
Add ingredients (salt, spices, oil...)	A few minutes	Simply add ingredients, mixing is manual	
Bottle and seal	A few minutes per bottle	Manual, using a funnel	


TOMATOES
WASH AND SORT
CRUSH
PRECOOK
MIX INGREDIENTS
THICKEN
ELIMINATE SKIN AND SEEDS
BOTTLE AND SEAL

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APPENDIX 10

Abbreviations

RA : Rural Agrobusiness.

ANDES : Proyecto Alimentación, Nutrición y Desarrollo en el Ecuador.

CELATER : Centro Latinoamericano de Tecnología y Educación Rural.

Centro IDEAS : Centro de Investigación, Documentación, Educación, Asesoramiento y Servicios (Peru).

CEPROD : Centro de Estudios y Promoción del Desarrollo (Honduras).

CIAT : International Centre for Tropical Agronomy.

CIMPA : Centro de Investigación y Mejoramiento de la Panela (Colombia).

CITA : Centro de Investigaciones en Tecnología de Alimentos de Costa Rica.

ENDA : Environment and Development in Africa.

ERTEC : Espace Rural pour Technologues.

FIBGE : Fundacao Instituto Brasileiro de Geografia e Estatistica (Brazil).

FUNDACEA : Fundación Colegio Experimental de Agricultura del Mundo Unido - Simón Bolívar (Venezuela).

GIA : Grupo de Investigaciones Agrarias (Chile).

GRAF : Research-Action-Training Group.

GRET : Research and Technological Exchange Group.

IICA : Interamerican Institute for Cooperation in Agriculture.

INCAP : Instituto de Nutrición para Centro América y Panamá.

INIA : Instituto Nacional de Investigaciones Agropecuarias (Ecuador).

ITA : Institute of Food Technology.

PRODAR : Programa de organización y administración para el desarrollo rural.

PRODESSA : Centro de Promoción y Asesoriá en Investigación, Desarrollo y Formación para el Sector Agropecuario (Nicaragua).

REDAR : Red de Desarrollo de la Agroindustria Rural.

RETADAR : Red Tecnológica Alimentaria Apropiada al Desarrollo Agroindustrial Rural.

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RURAL AGROBUSINESS

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For many years, food and nutrition-related policies tented to concentrate on the qualitative and quantitative improvement of food. Then, at one point, certain programmes attempted to intensify the food transformation process, through the development of traditional techniques, to combat post-harvest losses. This trend too often emphasizes technology as an end in itself, rather than as a tool serving the broader objective of human and economic progress.

The integration of storage, transformation, packaging, transportation and commercialization of agricultural products, in addition to their actual production, brings peasants one step closer to the advancement and control of development : their own and that of the rural world in general.

The concept of rural agrobusiness (RA) developed in this issue should spur an improvement in the living and dietary conditions of peasant families, represent an additional reason to remain on the land, create employment and help to provide training for people. RA is experienced as a contribution to progress and to the economic integration of peasants and of the rural world in their country's development, and seems to be a lever for communication with the cities.

The present overview is the outcome of a several year-long process in which a group of specialists thought the problem out, in the light of the concrete experiences of peasant communities.

We wish to make this spirited effort known, and hope that it will spur further experiences, on other continents, so that peasants will become active, respected entrepreneurs.

With thanks to Micheline d'Agostino - ICC for the cover illustration

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